ScadaPhone User Manual

Version 5.0.3.40

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Introduction

About ScadaPhone

ScadaPhone is a 32 bit Windows based alarm dialer designed to work with Windows based SCADA systems. ScadaPhone's primary function is to continuously poll a SCADA system for the status of discrete, analog, and string tags and place telephone calls to report alarms as they are triggered. Alarms may also be triggered from computed discrete tags. The SCADA tags that trigger a callout, the alarm messages, and the people (contacts) to call may be customized for your application.

In addition to alarm dialing, ScadaPhone allows a user to dial into the system from any touch tone phone to hear SCADA system alarms, analog and discrete values, and, (with the proper access level), to change analog and discrete values (setpoints). ScadaPhone also allows the creation of voice mail boxes which will act as an answering machine.

ScadaPhone can be licensed in one of two configurations, the full featured version known as ScadaPhone with all the features described in this help file and a limited version known as ScadaPhoneLite. The 'Lite' version has the following Project limitations:

1. Maximum of 16 alarms
2. 1 user defined menu (MainMenu)
3. 1 alarm group
4. No e-mail contacts
5. No computed tags
6. No RAS (Remote Access Software) interface

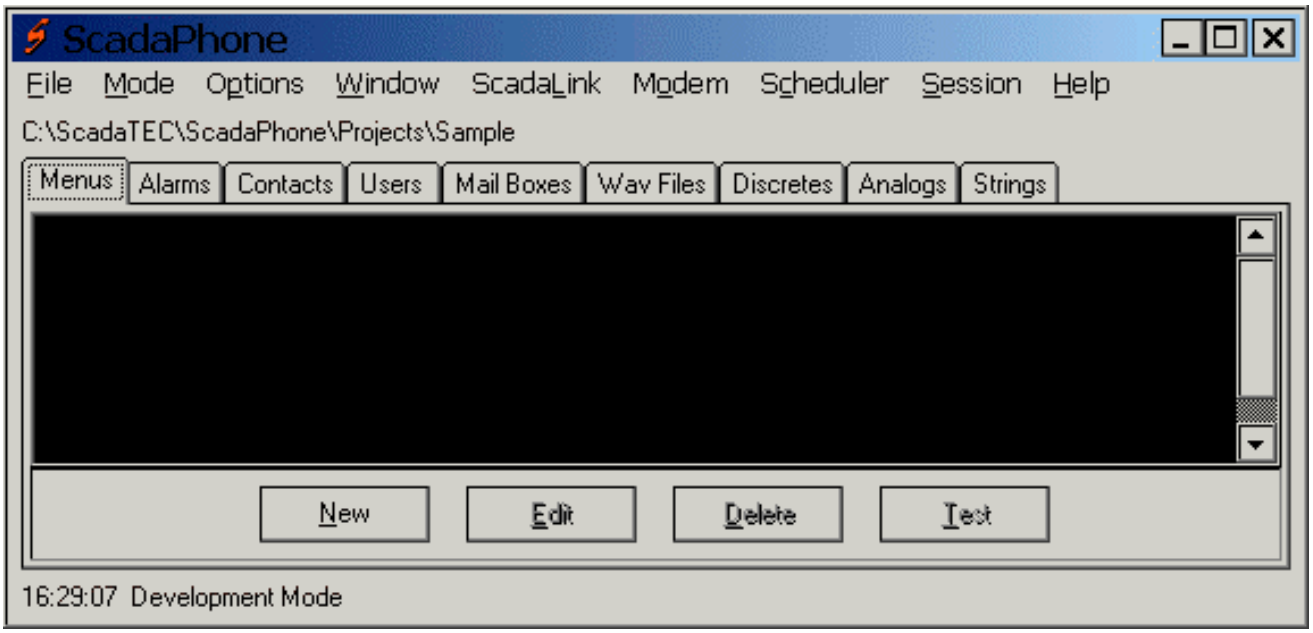
This same help file is used for both systems so please keep the above limitations in mind.

A ScadaPhoneLite system may be upgraded to the full ScadaPhone system by obtaining and entering a new 'Full Featured' authorization code in the registration window. (Help | About | Register)

ScadaPhone is very versatile yet simple to configure and use. It has default setups for the following SCADA systems:

- Citect
- GE Cimplicity
- Excel (for testing)
- Intellution FIX DMAX
- LookOut
- RSView
- RSLinx
- Siemens, WinCC
- USDATA Factory Link
- Wonderware InTouch
- Wonderware FSGateway

The ScadaPhone main window appears as follows:



ScadaPhone main window

The main window consists of (from top to bottom):

- Main menu (File, Mode, Options, etc....)
- Project name and location (C:\ScadaTEC\ScadaPhone\Projects\Sample)
- Tab control (Menus, Alarms, Contacts, etc....)
- A white list box containing the items pertaining to the selected tab
- Buttons -- the buttons vary depending upon the selected tab and ScadaPhone's current operating mode
- Status label -- time and Development Mode or Run Mode

ScadaPhone comes with a sample project (named *sample*.) The files in this project can be customized to meet the user's specific needs or a new project may be created.

Related Topics:
Basic Steps for Creating a Project
Main Menu Overview
Main Window Tab Overview

Basic Steps for Creating a Project

A ScadaPhone project consists of various files needed to define users, passwords, schedules, tag names, alarms, menus, and other items required for a customized system. ScadaPhone groups these project definition files into a project folder (or project directory). Project definition files include text files, (containing definitions of alarms, menus, telephone contacts, etc.), as well as WAV files, (containing the voice messages that enunciate alarm and menu messages.) A typical project folder will contain a few text files (Alarms.txt, Menus.txt, Contacts.txt, and so forth) and a few dozen WAV files.

A new project is created in Development Mode. An indicator at the bottom of the ScadaPhone main window shows whether ScadaPhone is in Development Mode or Run Mode. The first time ScadaPhone is started, it will startup in Development Mode. After that, which ever mode ScadaPhone is in when exited is the mode it will start up in when next started. To switch from one mode to the other, select **Mode** from the top menu and select either **Development** or **Runtime**.

There are ten basic steps to create a new ScadaPhone project:

- Set up a Project
- Set up the Modem COM Port
- Create a Supervisor and set up other Users
- Create a Schedule
- Enter Tag Names
- Enter Alarm Contact Information
- Create Alarm Tags and Messages
- Create and Edit Phone Menus
- Configure the SCADA Link Interface
- Test Alarm Callouts in Run Mode

Note: ScadaPhone comes with a sample project (named *sample*.) The files in this project can be customized to meet the user's specific needs or a new project may be created.

How to Use Help

Open **Help** by selecting it on the top menu bar.

The Help menu offers **Contents**, **Index**, **Search for Help On**, and **Tutorial**.

Selecting **Tutorial** will open a Help window with step-by-step instructions for creating a sample project.

Selecting **Contents**, **Index**, or **Search for Help On** opens a Help window containing a left navigation pane with **Contents**, **Index**, and **Search** tabs. The Help window opens with the selected tab displayed. Click on another tab to select it. The left navigation pane allows access to specific topics and keywords. The right pane contains information about the selected topic.

Contents

The contents tab displays topics in a format similar to a printed book's table of contents. Topics are arranged in a tree-style outline. The book icons represent a major topic. Open a book by clicking on the plus sign next to it or by double-clicking on the book. An opened book displays a list of specific topics. Click on a specific topic under the book to display that information in the right pane. Close a book by clicking the minus sign next to it or by double-clicking on the open book.

Index

The index allows searches for specific words or phrases. A word may be typed into the **keyword** box or selected by using the right scroll bar. Use the scroll bar to scroll through the list of keywords, click on the desired keyword, and click the **Display** button.

If there is only one topic associated with the keyword, the information will be displayed in the right pane. If there is more than one topic associated with the keyword, a second box will open with a list of topics. Select the topic to display from the list.

Search

Search allows searches for any words that occur within the content of the Help system. Enter the desired words or phrases in the keyword box and click **List Topics**. A list of topics containing the keyword(s) will be displayed. Click on the desired topic and click the **Display** button. The topic will be displayed in the right pane with the keyword(s) highlighted.

Installation

Hardware Installation

ScadaPhone is shipped with a top-quality voice modem, serial cable, and a microphone that have been certified to work with the system. A speaker to work with the modem is also available as an option. During development of a project, the recording and playback of sound (WAV) files may be done either through the voice modem or a PC sound card. To use the PC sound card, you will need to provide a microphone and speakers that are compatible with the sound card. If you do not plan to use the PC sound card, you will need to order the optional speaker.

Follow the instructions that come with the modem to connect the phone line, microphone, and power to the modem. If using the voice modem to record and play sound files, connect the optional speaker shipped with the modem.

If using the PC sound card to record and play sound files, connect compatible microphone and speakers.

Connect the serial cable between the modem and one of the computer's COM ports. Make note of which COM port the modem is connected to. It is recommended that you connect the modem to a telephone line that is not shared with any other office telephone or part of a multiple line telephone system. Furthermore, the telephone line must be a standard voice line, not digital or ISDN.

Software Installation

ScadaPhone's installation program (ScadaPhoneInstall.exe) installs ScadaPhone into selected folders and provides options to create desktop and/or start menu shortcuts.

> To install from a CD, insert the CD and wait for the automatically triggered screen to appear. Select **Install ScadaPhone** to start the install program. **Note**: If the automatic trigger screen does not appear, use Windows Explorer to display the contents of the CD and double click AutoRun.exe.
>
> If you have downloaded ScadaPhoneInstall.exe from www.scadatec.com, execute the install program by using Windows Explorer to navigate to the ScadaPhoneInstall.exe file and double click on it.
>
> If you are installing from floppies, use Windows Explorer to display the contents of the floppy and double click Install.exe from the root directory of the first floppy.

When the install program appears, note the two blue labels which contain the default folders for ScadaPhone's program files and a ScadaPhone sample project. Click on a blue label to change the default folder to a new location. Also note the check box next to the **Sample Project** item. Uncheck this box to NOT install the ScadaPhone sample project.

When all options are complete, click the **Install** button at the bottom of the install program window. Follow the prompts to complete the installation.

To start ScadaPhone automatically when the PC is re-booted, place a shortcut in the startup folder.

Main Menu Overview

File | Project

Load/New

Opens an existing project or starts a new one.
Details: Setting up a Project

Save

Saves a project.
Details: Saving a Project

Save As

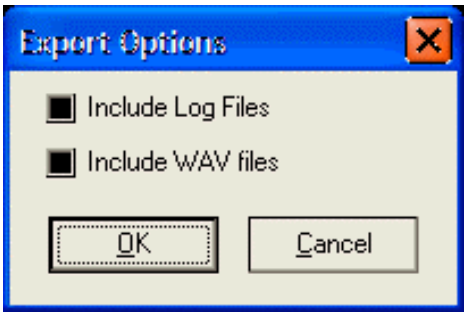
Saves a project with a new name.
Details: Saving a Project

Rename

Opens a dialog box which allows entry of a new name for an existing project.

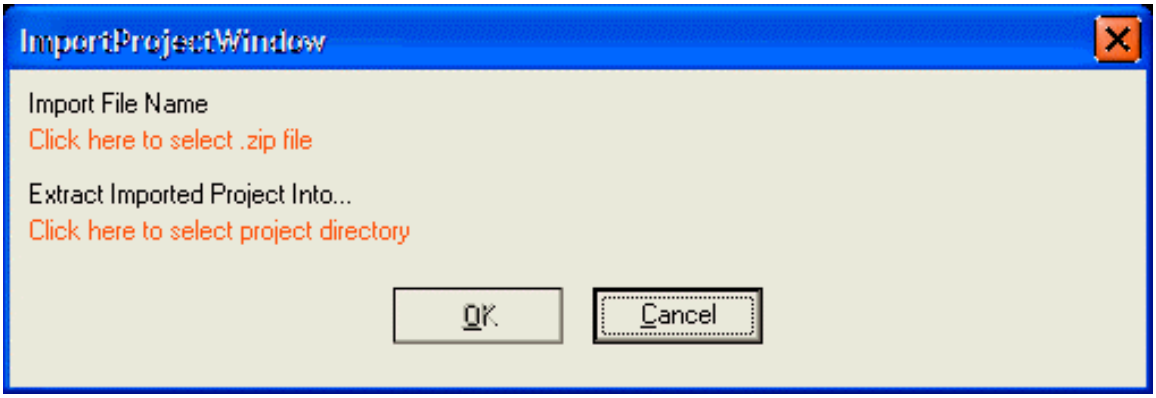
Export

Allows users to create a .zip copy of the current project so that it can be transferred from one machine to another with ease. The wav and log files may be included or excluded from the export as desired.



Import

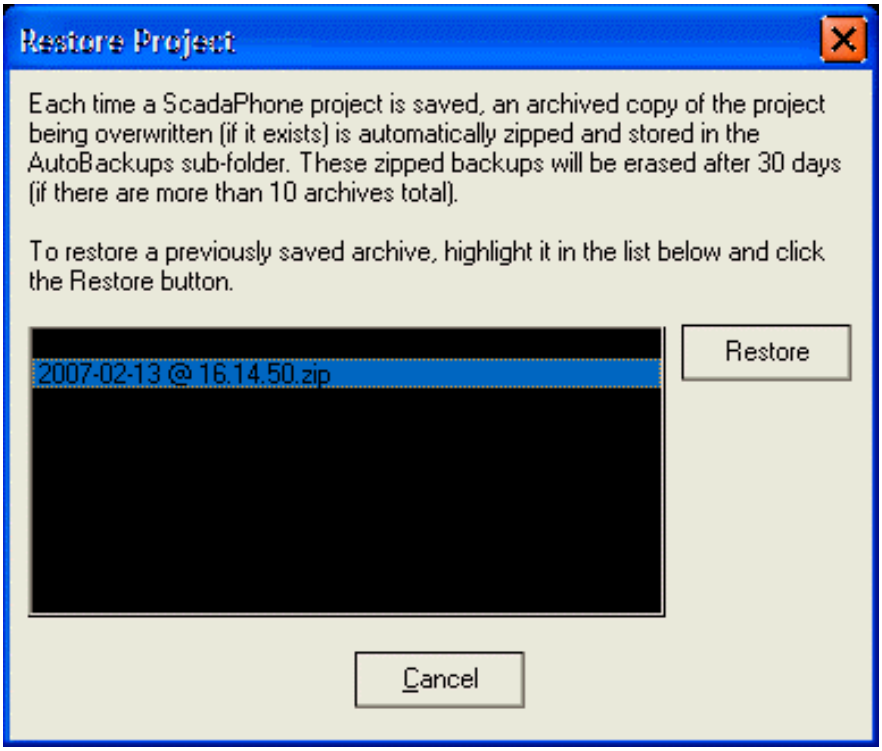
Allows the importing of projects that were exported with the export feature. The import filename and project directory to import to may be selected by clicking on the red text.



Restore

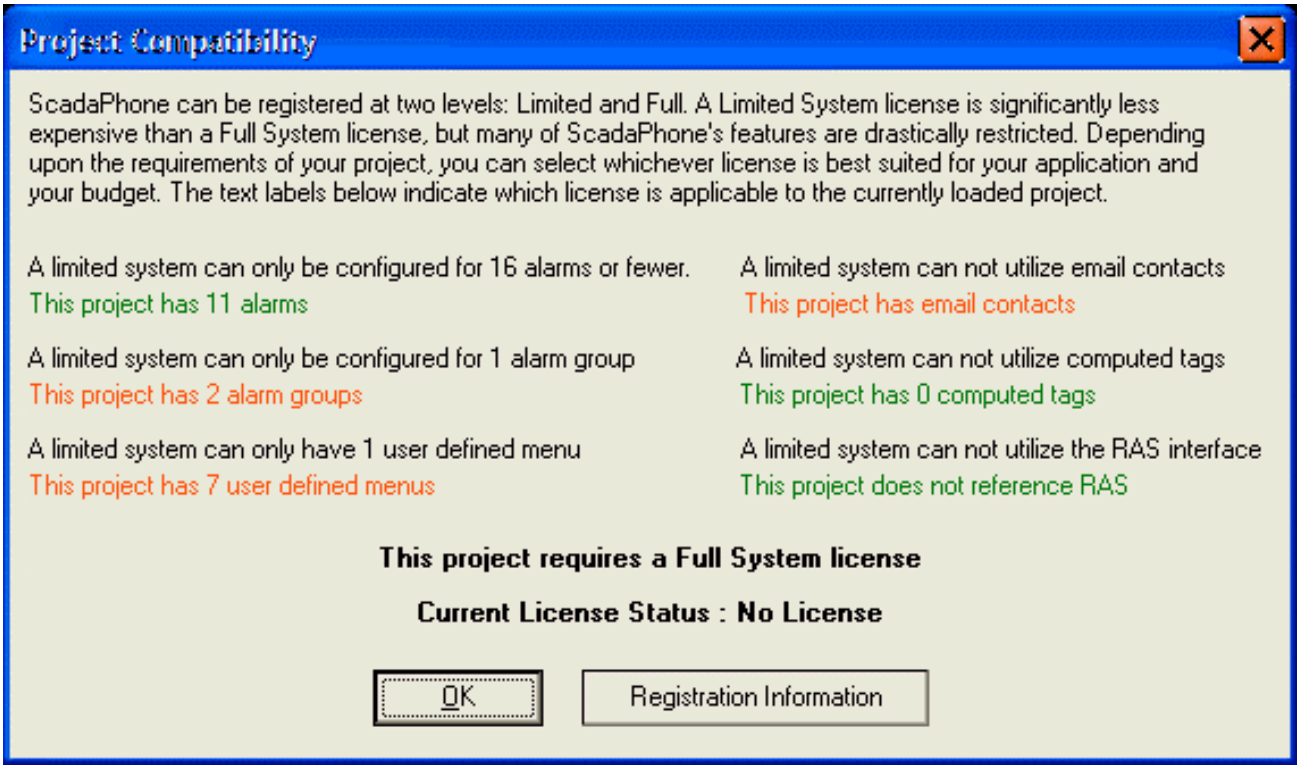
Each time a ScadaPhone project is saved, an archived copy of the project being overwritten (if it exists) is automatically zipped and stored in the 'AutoBackups' sub-folder. These zipped backups will be erased after 30 days (if there are more than 10 archives total).

This feature allows the selection and restoration of these backups



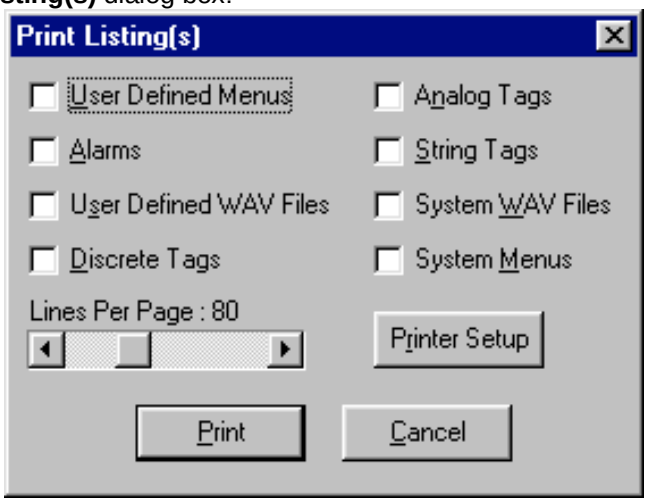
Compatibility

This shows the Project Compatibility window (which delineates the list of limitations for the 'Lite' system).



Print Listing(s)

Opens the **Print Listing(s)** dialog box:



Click the checkbox for the option(s) to be printed and click the **Print** button. Click the **Printer Setup** button to change printer settings. Click **Cancel** to close the dialog box without printing.

File | Program

About

Provides version number, computer key, registration status, and allows transfer of the authorization code to another PC.
Details:
Registering ScadaPhone
Transfer Authorization Code

Register

Allows registration of ScadaPhone.
Details: Registering ScadaPhone

Uninstall ScadaPhone

Un-installs ScadaPhone from the current system.

Create Shortcuts

Opens the **Create Shortcuts** dialog box:

Create Start Menu Shortcut adds a shortcut to start ScadaPhone via the Start menu. To use this shortcut, click the Start button and select **Programs | ScadaTec | ScadaPhone**.

Create Desktop Shortcut places a shortcut on the desktop. To use this shortcut, doubleclick the ScadaPhone icon on the desktop.

Create Start-Up Shortcut places a shortcut in the Windows Startup folder. This shortcut will cause Windows to automatically start ScadaPhone when the computer is first turned on.

File | Exit

Exits ScadaPhone

Mode

Development

Switches ScadaPhone to Development mode.
Details: Development Mode and Run Mode

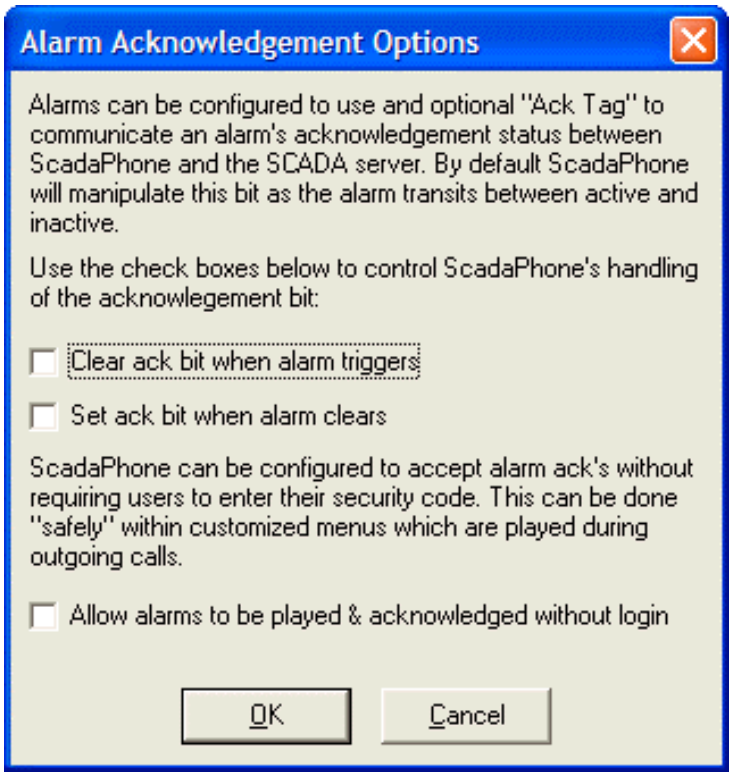
Runtime

Switches ScadaPhone to Run mode.
Details: Development Mode and Run Mode

Options

Alarm Ack Options

Opens the Alarm Acknowledgement Options dialog.

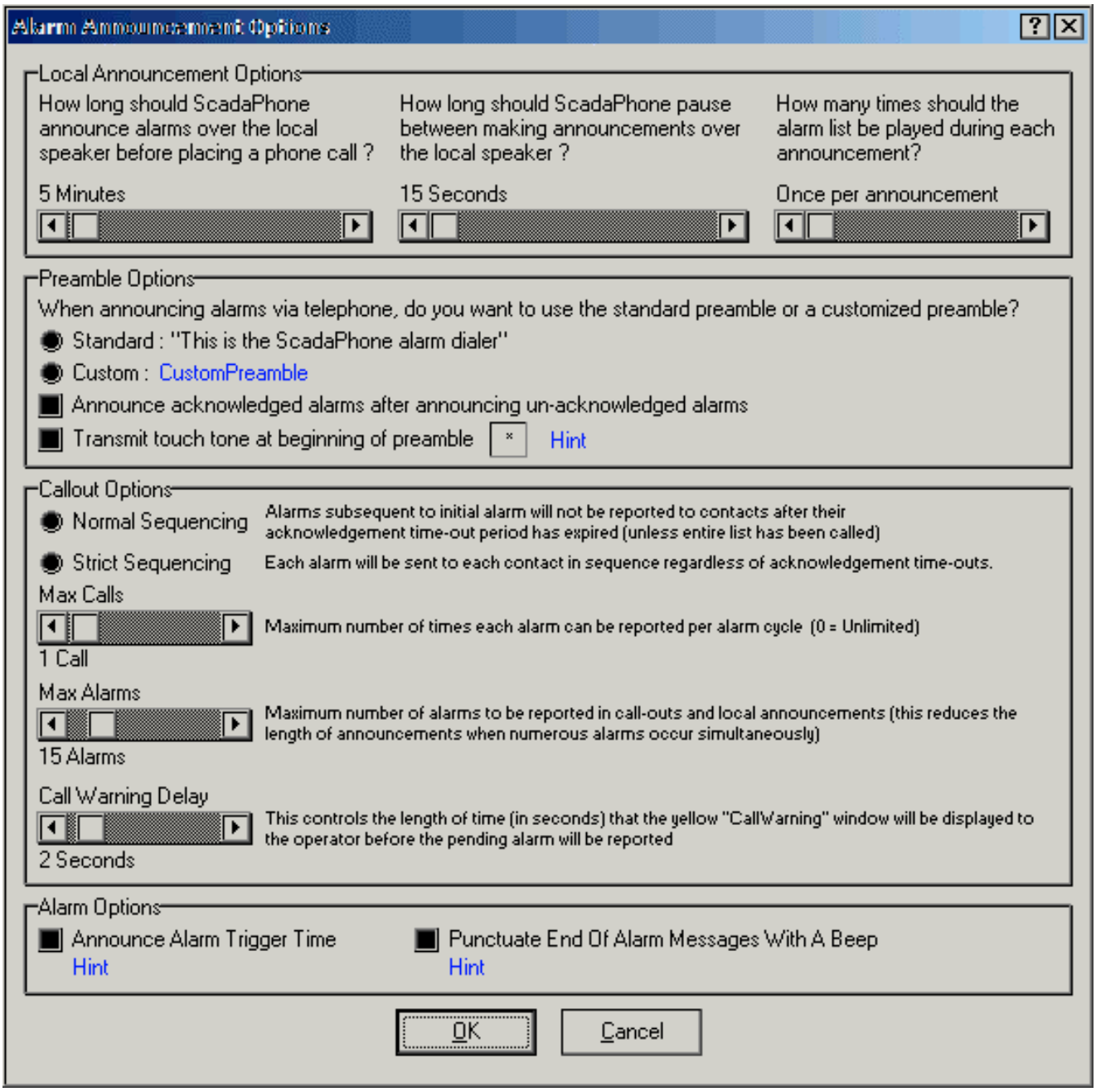


The user can control how ScadaPhone handles the alarm acknowledgement bit. The options are:

- Clear the acknowledge bit when alarm triggers
- Set the acknowledge bit when alarm triggers
- Allow alarms to be played and acknowledged without login

Alarm Announcement

Opens the **Alarm Announcement Options** window:



The three scroll bars are used to set the following:

1. How long the alarms should be announced over the speaker before placing a telephone call
2. How long ScadaPhone should pause between announcing alarms
3. How many times the alarms should be announced during each announcement.

A customized preamble may be created by clicking the Custom radio button and clicking the blue WAV file link.

A touch tone may be added to the beginning of the preamble file by selecting the **Transmit touch tone at beginning of preamble** option and clicking the button following the option.

The Callout Options frame provides options to:

1. Control how alarms are reported to contacts that have not acknowledged previous alarms.
2. Limit how many times an alarm is reported.
3. Adjust the length of time a local alarm warning is given before the callout is made.

Details: Alarm Announcement Options

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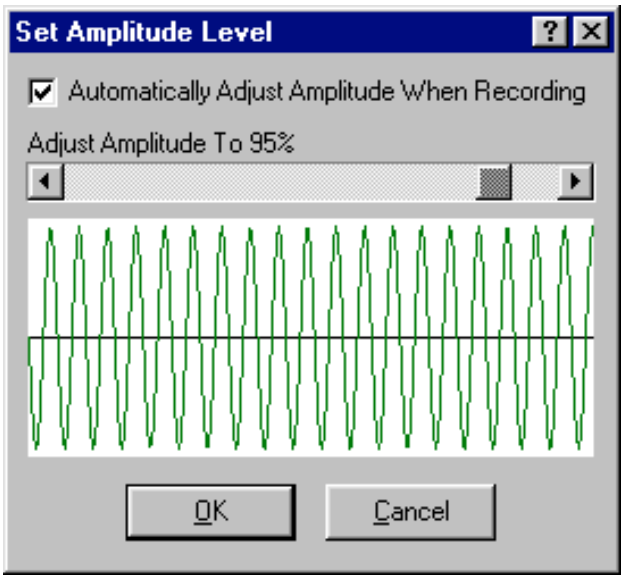
Amplitude Adjustment

Opens the **Set Amplitude Level** dialog box:



When the option **Automatically Adjust Amplitude When Recording** is toggled on (as indicated by a checkmark), the amplitude of all future recorded WAV files will automatically be adjusted to the level specified by the scroll bar. To adjust all existing WAV files, see the following related topic.
Related Topic: Editing WAV Files

Audio Devices

Opens the **Audio Device Options** window:

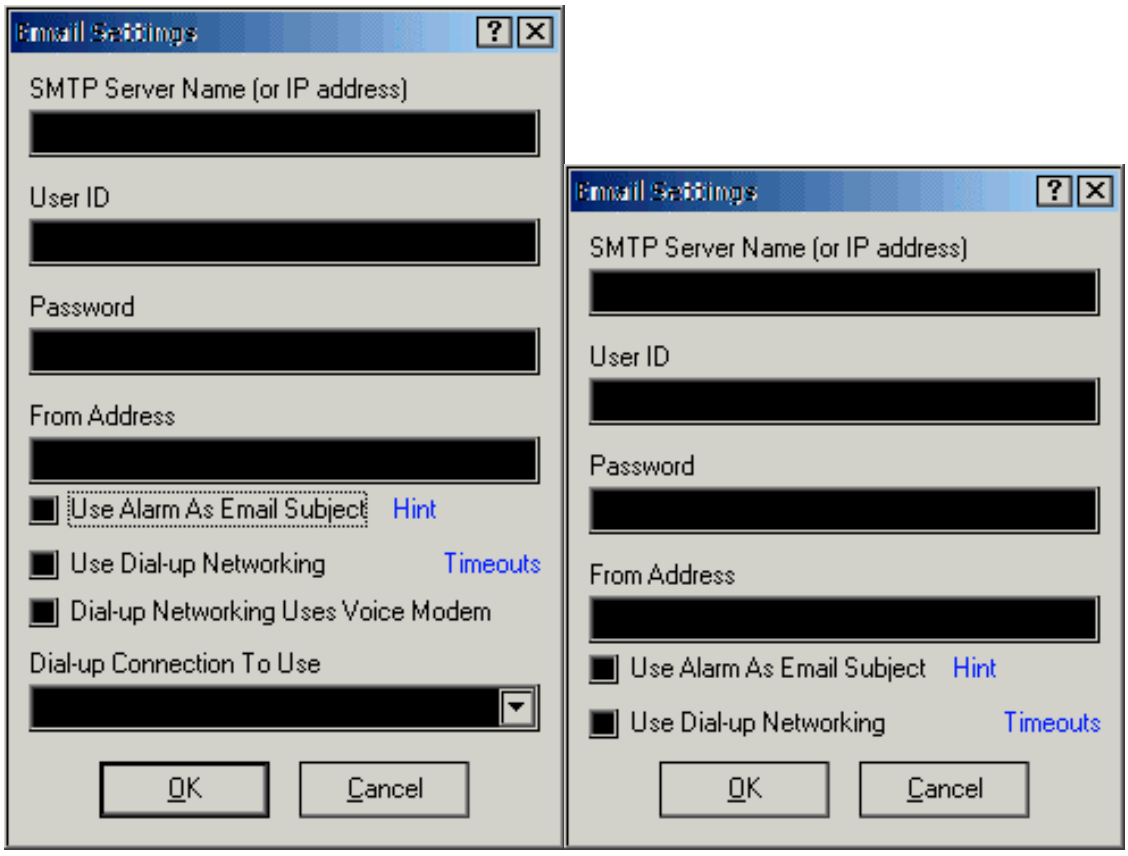
This window offers the following options;

Use Sound Card When Possible: When this option is checked and the modem is hooked up and working, ScadaPhone will use the modem to dial out to make alarm calls and answer calls, but when playing and recording WAV files, ScadaPhone will use the sound card.

When playing audio via telephone...
Use telephone only (mute speaker): When this is selected, ScadaPhone will use only the telephone to play alarm messages or menu options.
Use telephone and speaker: When this is selected, ScadaPhone will play alarm messages or menu options over both the telephone and the speakers.

Email Settings

This menu option opens the **Email Settings** dialog box:



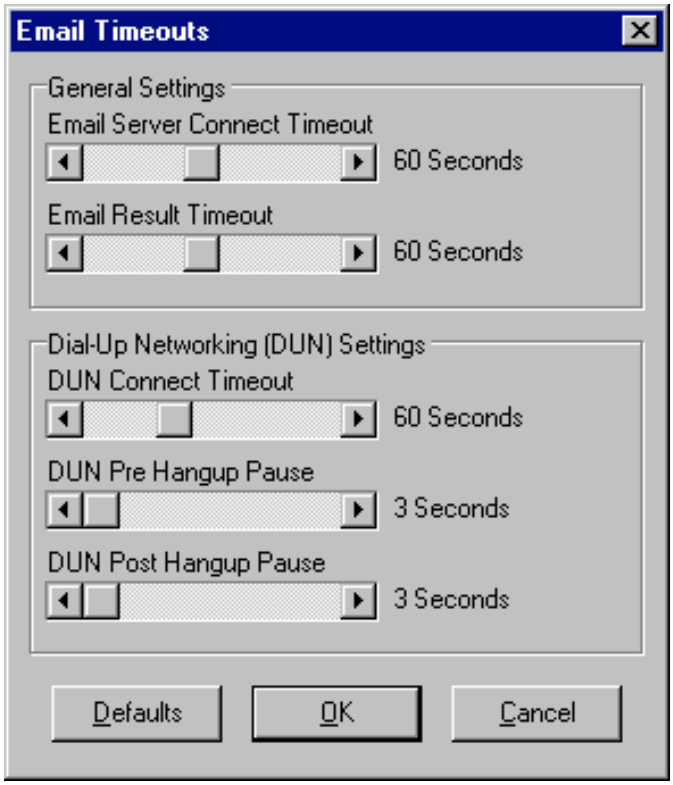
Instead of dialing a pager or a phone, ScadaPhone can send alarm notification via e-mail. To send a message via email requires the following:

(1) Select the **Email** option in the Alarm Contact Window. Enter the e-mail address in the box.
(2) Create the alarm text message to be sent in the Alarm Information Window.
(3) Enter the e-mail settings in the above **Email Settings** dialog box.

- Enter the name of the SMTP server or IP address. This is the same name entered in **Outlook** or **Outlook Express** on the **Servers** tab for the Outgoing mail (SMTP) server. (In **Outlook Express,** this is found under **Tools | Accounts**. Highlight an account, select **Properties** and select the **Servers** tab.) For example: *mail.greatbasin.net*
- **User ID** is the user name that is entered in the Dial-up Connection box for the above mail server.
- Enter the user **password.**
- **From Address** is the text that will be placed in the **From** line of the e-mail message. This

may be used to identify the ScadaPhone system that is sending the e-mail message.

- **Use Alarm As Email Subject** - By default, ScadaPhone set the subject line of all outgoing emails to "ScadaPhone Alarms"; the Use Alarm As Email Subject option allows you to change this behavior so that the newest and most high priority alarm text message will be used as the subject of the outgoing email.
- **Use Dial-up Networking** - This box must be checked if the e-mail is to be sent via a dial-up network connection instead of using a network connection to the e-mail server. Note: If this is grayed out it means that there are no dial-up networking connections configured on the PC.
- **Dial-up Networking Uses Voice Modem** - This box must be checked if the dial-up network connection is to use the same modem ScadaPhone uses for callout notifications instead of a separate modem.
- **Dial-up Connection to use** - Select the desired dial-up connection from the drop down list. If there are no connections in the list, use the MS Windows Dial-Up Networking applet to create one.
- **TimeOuts** - Clicking on this blue text brings up the E-mail Timeouts dialog box:

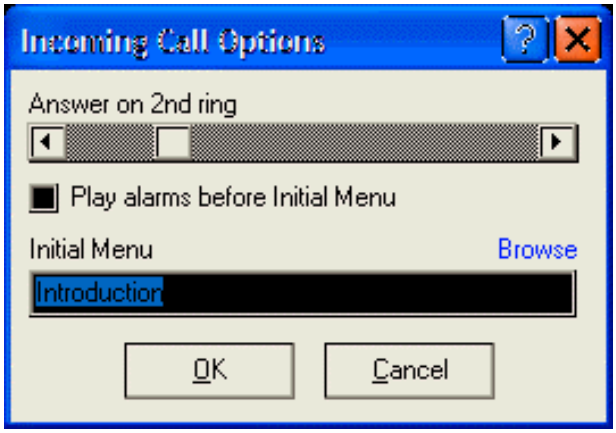


The following timeout values may be set from the Email Timeouts dialog:

- **Email Server Connect Timeout** - the time ScadaPhone will wait for dial-up networking to connect to the email server.
- **Email Result Timeout** - the time ScadaPhone will wait for the e-mail result code after sending the e-mail.
- **DUN Connect Timeout** - the time ScadaPhone will wait for the Dial-Up Networking component to make the connection.
- **DUN Pre Hangup Pause** - the time ScadaPhone will wait after receiving the email result before it hangs up the connection. This time may need to be increased if an anti-virus program scans the e-mail before sending it.
- **DUN Post Hangup Pause -** the time ScadaPhone will wait after hanging up the dial-up connection before accepting alarm acknowledgements.

Incoming Calls

Opens a dialog box which uses a scroll bar to set the number of rings before ScadaPhone will answer an incoming call. Select a different initial menu name (By default, the MainMenu is played when an incoming call is detected.). It also provides an option to play the active alarms before the initial menu.



Details: Changing the Starting Menu

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Log 'System Active' Hourly

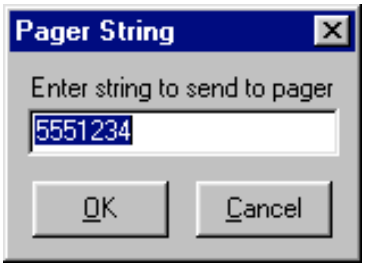
When toggled on (as indicated by a checkmark), ScadaPhone makes an entry in the **Activity Log** each hour indicating that the system is alive and operating in Run Mode.

Minimize On StartUp

When toggled on (as indicated by a checkmark), ScadaPhone will startup minimized. This may be useful to prevent ScadaPhone from starting up on top of the SCADA software and confusing the operator. There is a short delay before ScadaPhone is minimized to allow the operator to prevent minimization. Note: This will only work in 'Run' mode.

Pager String

Opens the **Pager String** window:



The pager string is used for numeric pagers only. The phone number entered into this dialog box is stored in the system variable named PagerStr. This variable is used in answer detection scripts. After ScadaPhone calls the number specified in the **Alarm Contact** window and receives a pager signal tone, it sends the phone number entered into the **Pager String** dialog box. This is the phone number that the pager user is to call and is typically the access number of the SCADA system or the ScadaPhone system.
Details: Pager Alarm Contact Example

Remote Access Software

This option allows ScadaPhone to be configured to interact with Remote Access Software such as pcAnywhere. This feature allows ScadaPhone to share the voice modem with the Remote Access Software, thereby eliminating the need for an extra modem.
Details: Remote Access Software

Show System Info

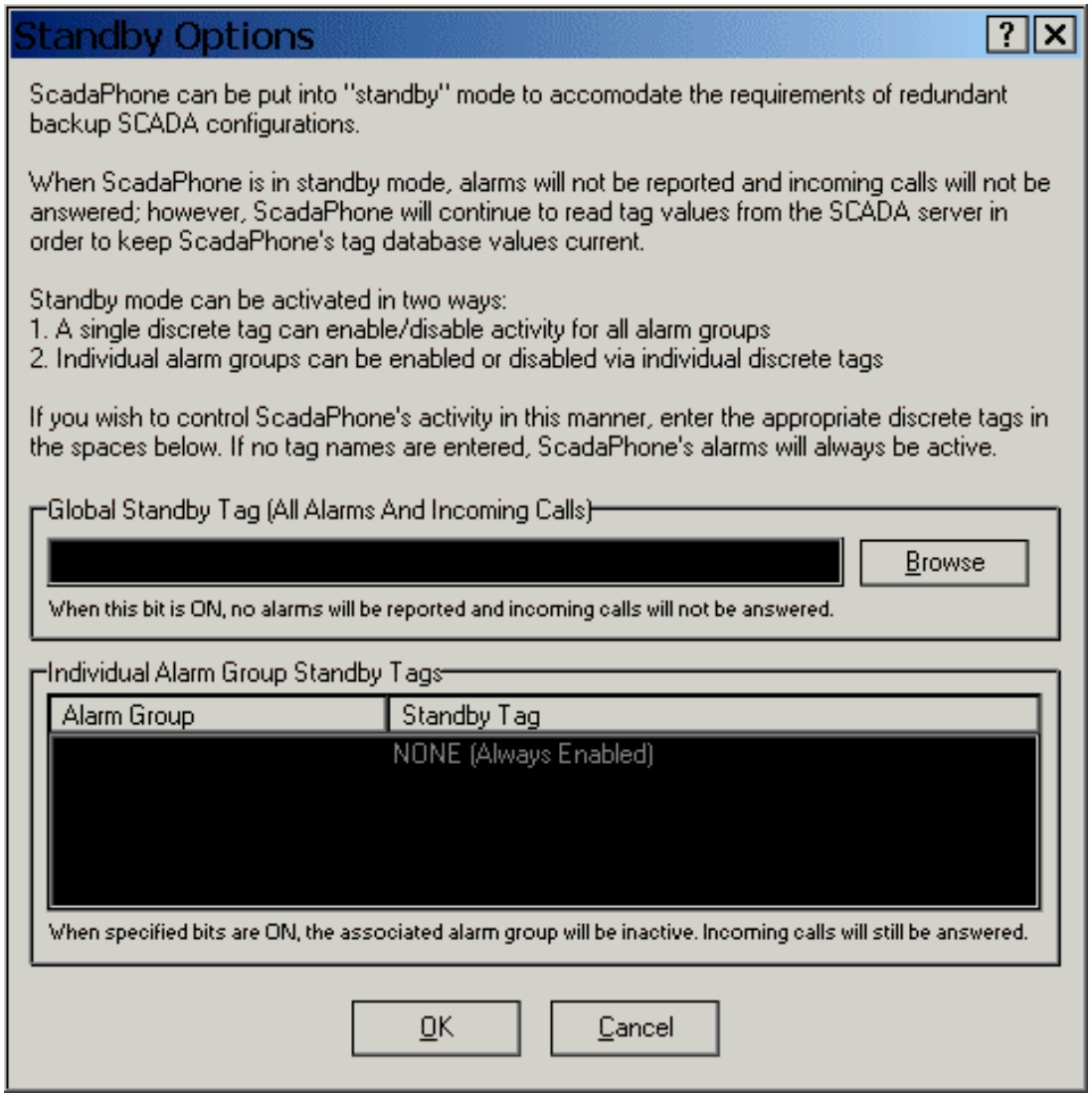
When toggled on (as indicated by a checkmark), ScadaPhone displays system tag names on the Discretes, Analogs, and Strings tabs and also displays two additional tabs: System Wavs and System Menus.

Shutdown Tag

Opens a dialog box which allows entry of a discrete tag which will cause ScadaPhone to be shut down when it is set to TRUE.

Standby Options

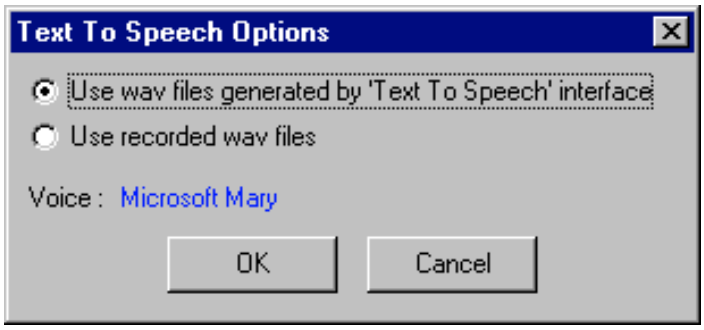
Opens the following dialog box which allows entry of a single discrete tag which will cause ScadaPhone to go into General Standby Mode when it is set to TRUE. Also, individual alarm groups may be placed in standby mode by entering separate discrete tags for each alarm group. In General Standby Mode, ScadaPhone will continue to poll the SCADA database for tag values but will not report any alarms or answer any incoming calls. If individual alarm groups are placed in standby mode, ScadaPhone will continue to poll the SCADA database for tag values but will not report any alarms in the alarm groups that are in standby but will continue to answer any incoming calls even if all call groups are individually placed in standby. This feature may be used to eliminate conflict between SCADA nodes linked in a hot-backup configuration.



Text To Speech

Selecting this option causes ScadaPhone to generate the speech WAV files for tag names and text. This can be used instead of actually recording the WAV files for the alarm announcement text. **Note:** This optional feature requires that the Microsoft voice and speech components be installed. The MS Installer files needed to install the Microsoft voice and speech components are SAPI5SpeechInstaller.msi and SAPI5VoiceInstaller.msi.

Selecting this menu option opens the **Text to Speech Options** window.

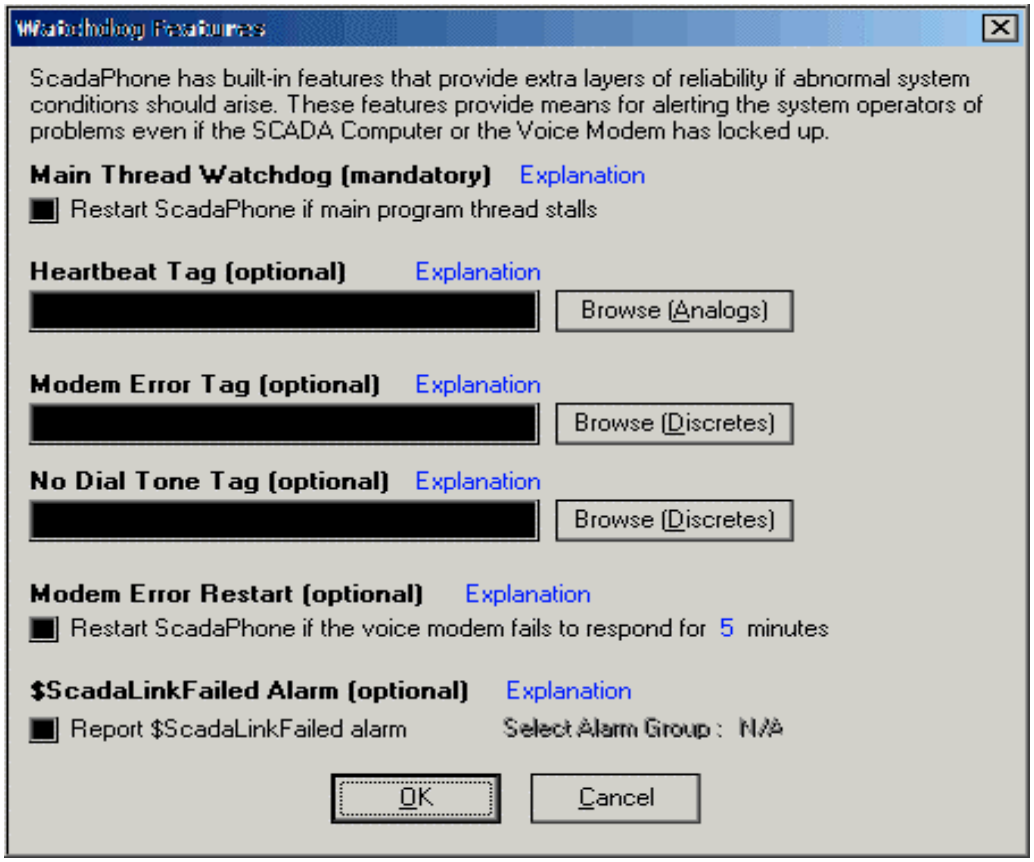


This window allows the user to choose whether to use the recorded WAV files or the WAV files generated by the text to speech interface. If the option to use the WAV files generated by the text to speech interface is selected, then the voice that will be used may be selected by clicking on the blue text following the **Voice:** option. After selecting the 'Text to Speech' option and clicking the **OK** button, ScadaPhone will begin converting all of the existing user and system WAV files into WAV files to the selected voice. The WAV files are saved in separate folders, *\ScadaPhone\SystemFiles\TTS* and *\ScadaPhone\Projects\projectname\TTS*.

Details: Text To Speech Interface

Watchdog Features

This is where all of ScadaPhone's watchdog features are consolidated.



Details Watchdog Features

Window

Activity Log

The Activity Log displays a log that keeps track of important events such as when alarms trigger, when calls are made, when acknowledgements are received, etc... The supervisor can check this log to see what has happened over the last 31 days. The **ViewArchives** menu item in this window brings up the CLogViewer which will let you combine various log files so they can be viewed together..

Alarm Group Statuses Window

Displays the alarm group statuses window. Thhis wildow displays the status of all alarm groups. This window may also be displayed by clicking on the status bar at the bottom of the ScadaPhone window. Note: This window is only available in 'Run' mode.

Alarms

Displays the information on the **Alarms** tab in a separate window

Analog Tags

Displays the information on the **Analogs** tab in a separate window

Audio Analyzer

Opens the **Voice Modem Audio Analyzer** window.
Details: Audio Analyzer

Call Log

The Call Log shows the pertinent information for each call such as Contact, User, Alarm, Alarm Group, Audio Analyzer File, and Call Events.

Contact Sequence Log

Opens the contact sequence log which displays a log of the time and events for each alarm contact attempt.The supervisor can check this log to see what has happened over the last 31 days. The **ViewArchives** menu item in this window brings up the CLogViewer which will let you combine various log files so they can be viewed together.

Discrete Tags

Displays the information on the **Discretes** tab in a separate window

Email Log

Opens the Email log window which displays the events that occur when sending each email. This log is used mainly for troubleshooting. The supervisor can check this log to see what has happened over the last 31 days. The **ViewArchives** menu item in this window brings up the CLogViewer which will let you combine various log files so they can be viewed together.

Performance Log

Displays the date and time, CPU usage, and memory used by ScadaPhone. It also shows the time and date of program start, stop, and mode changes. A log entry is added each minute. The supervisor can check this log to see what has happened over the last 31 days. The **ViewArchives** menu item in this window brings up the CLogViewer which will let you combine various log files so they can be viewed together. The memory used value takes into consideration the number of processors in the computer.

Run Log

Displays a log of ScadaPhone start and stop times and runtimes. It lists the last 100 runs as well as the longest 100 runs of the program.

System Errors

Opens the ScadaPhone System Error Log, which keeps a listing of any error messages reported during the execution of ScadaPhone. If and when error messages pop up, ScadaPhone displays them in a popup **System Error** window and also logs them to the System Error Log. All system errors should be reported to ScadaTEC. Tech Support may request an e-mail copy of the error log file. The error log file is named ScadaPhoneSysErrorLog.txt and is saved in the project folder.
See: Contact ScadaTec

Window List

Displays a list of open ScadaPhone windows. Clicking on any window in the list will bring that window to the top.

SCADA Link

Setup

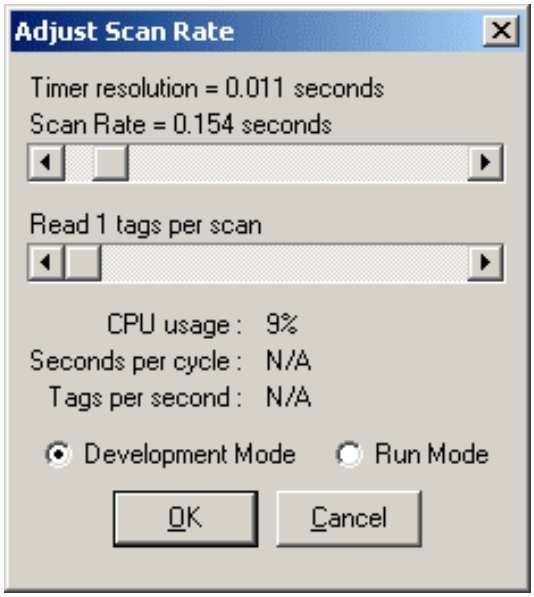
Opens the **SCADA Link Setup** window, which allows ScadaPhone to know the configuration of the SCADA software's tag server interface and enables the link.
Details: The SCADA Link Interface

Status

This item opens the SCADA Link Status window. This window displays the current status of the DDE, OPC or OLE queries between ScadaPhone and the selected SCADA system.

Scan Rate

Opens the **Adjust Scan Rate** window.



This dialog allows the user to adjust the rate at which ScadaPhone polls the SCADA software for data and the number of tags to read during each scan. If the scan rate is set too high, ScadaPhone will use a high percentage of the CPU's time; if the Scan Rate is set too low, it will take a long time for ScadaPhone to cycle through the list of SCADA system tags. The 'Development Mode' and 'Run Mode' radio buttons allow viewing of the CPU usage, Seconds per cycle, and the number of

tags read per second in either the development or run modes.

Response Log

Opens the ScadaLink Response Log window which displays a log of the response received for each tag polled via the ScadaLink interface.

Discrete Representations

Allows the configuration of representations of discrete values.
Details: Setting Discrete Representations

OPC Quality Options

Allows the setting of the acceptable level of OPC quality. The program will reject OPC data which is below this setting.

Server Startup Delay

Opens the **Server Startup Delay** window, which will configure ScadaPhone to wait a number of seconds at program startup before attempting to link to the SCADA server.
Details: Server Startup Delay

Modem

Opens the **Modem** window.
Details: The Modem Window

Scheduler

Opens the **Scheduler**.
Details: Creating a Schedule

Session

Opens a dialog box which allows the supervisor to log in and start a session or log out of a current session.

Help

Contents

Opens the Help window with the **Contents** tab selected.
Details: How to Use Help

Index

Opens the Help window with the **Index** tab selected.
*D*etails: How to Use Help

Search for Help On

Opens the Help window with the **Search** tab selected.
*D*etails: How to Use Help

Tutorial

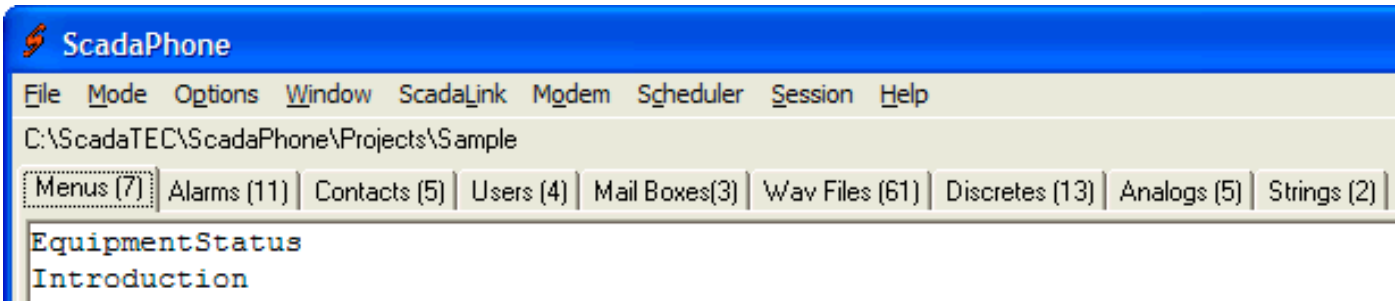
Opens a Help window with step-by-step instructions for creating a sample project.

About

Brings up the Program Information dialog box.

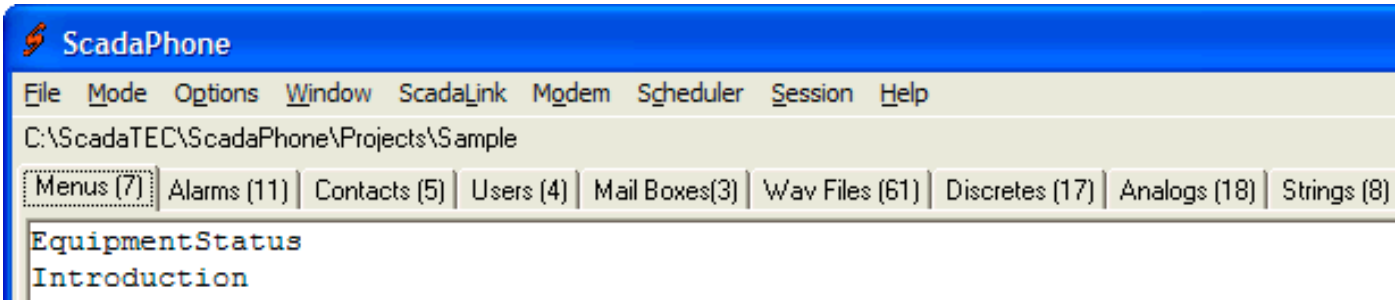
Main Window Tab Overview

When **Options | Show System Info** on the main menu is not checked, the main window tab set looks like this:



Main Window Tabs

If **Show System Info** is checked, two additional tabs are available:



Main Window Tabs with System Tabs

If the window is too narrow to display all the tabs, right and left arrow buttons will appear at the right end of the tab set. Click the arrow buttons to display additional tabs.

Below each tab is a list which contains the items pertaining to the selected tab (Menus, Alarms, Contacts, etc..) Below the item list are buttons. The buttons vary depending upon the selected tab and ScadaPhone's current operating mode (Development or Runtime). Some buttons are always enabled, other buttons are only enabled when a list item is highlighted or ScadaPhone is in Development mode.

The tabs are:

Menus Tab	Discretes Tab
Alarms Tab	Analogs Tab
Contacts Tab	Strings Tab
Users Tab	Sys Wavs Tab
MailBoxes Tab	Sys Menus Tab
Wav Files Tab	

Menus tab

When a person contacts ScadaPhone by phone, the caller is presented with an automated menu system.

ScadaPhone comes with a default menu structure. However, the menu messages and choices presented to the person on the phone may be customized. The **Menus** tab gives access to the list of user defined menus. There are four buttons on the **Menus** tab:

New	Creates new user defined menus (development mode only).
Edit	Opens and loads the **Menu Information** window with the selected menu (development mode only).
Delete	Removes unwanted menus (development mode only).
Test	Plays the selected menu over the modem speaker or telephone (depending upon the settings selected in the main menu **Options | Modem Devices**) for testing purposes (development mode only).

Details: Creating and Editing Phone Menus

Alarms tab

ScadaPhone allows an unlimited number of alarm messages to be defined. The alarm messages report the status of alarm bit tags in a SCADA system. These alarms may be grouped so that different groups of people can be notified for different alarms. The **Alarms** tab gives access to the list of alarms. Additionally, the items in the alarm list display alarm status information. When an alarm bit is on but the Signal Filtering delay time has not yet elapsed, the alarm line displays the amount of time remaining before the alarm is considered active. When an alarm is active, the background color of that line turns yellow and the text turns red. If an active alarm has not yet been acknowledged, the words “Awaiting Phone Ack” are also displayed. There are five buttons on the **Alarms** tab:

New	Creates new alarms (development mode only).
Edit	Edits pre-existing alarms (development mode only).
Delete	Removes unwanted alarms (development mode only).
Play	Plays the selected alarm (development mode only).
Ack	Acknowledges active alarms. When alarms are configured to require console acknowledgement, this is the button that registers the console acknowledgement (development and runtime).

Details: Creating Alarm Tags and Messages

Note: The information on the Alarms tab may also be displayed in a separate window by selecting **Window | Alarms**

Contacts tab

In ScadaPhone, the term *contact* refers to a telephone number that is to be called in the event of an alarm. The **Contacts** tab gives access to the list of alarm contacts. Which contacts are called and the order in which they are called is determined by the ScadaPhone **Scheduler**. *Details*: Creating a Schedule There are three buttons on the **Contacts** tab:

New	Creates new contacts (development mode only).
Edit	Edits pre-existing contacts (development mode only).
Delete	Removes unwanted contacts (development mode only).

Details: Entering Alarm Contact Information

Users tab

Access to ScadaPhone is controlled by passwords. A user list must be created in order to specify passwords and access levels for authorized users of the system. The **Users** tab gives access to the list of authorized ScadaPhone users. There are three buttons on the **Users** tab:

New	Creates a new user profile (development mode only).
Edit	Edits pre-existing user profiles (development and runtime).
Delete	Removes unwanted user profiles (development and runtime).

Details: Creating a User's List

Mail Boxes tab

The **Mail Boxes** tab gives access to the mail boxes created by menus that utilize the **Record Voice Mail** action. Mail boxes are folders (directories) where recorded WAV files are stored. Mailbox folders are created automatically, but must be manually deleted if the menu reference which created the mailbox is removed. When a mailbox contains messages, its line will be displayed with a green background. If the menu reference that created a mailbox has been removed, its line will be displayed with gray text. There are two buttons on this tab:

Open	Opens the selected mailbox and displays the available messages for playback and removal (development and runtime).
Remove	Allows removal of unwanted mailboxes that are no longer referenced by any of the user defined menus (development and runtime).

Details: Mail Boxes

Wav Files tab

The **WAV Files** tab displays the list of user defined WAV files that are referenced by the user defined menus and alarms. Filenames displayed in red indicate that the WAV file is referenced by an alarm or menu but does not exists on disk (The WAV file needs to be recorded). Filenames displayed in gray indicate WAV files that exists on disk but are not referenced by any alarms or menus. There are five buttons on this tab:

New	Opens the **Create New WAV file** dialog box to allow creation of new WAV files
Record/ (Generate)	Allows the re-recording of a selected WAV file. **Note**: If the 'Text to Speech' option is selected, the **Record** button will change to **Generate**. Selecting an existing WAV file and clicking on the **Generate** button will generate a new WAV file replacing the selected WAV file. The new WAV file will use the currently selected voice; the voice speaks the name of the WAV file.
Play	Plays the selected WAV file.
Edit	Opens the Edit WAV File window loaded with the selected WAV file. *Details*: Editing WAV Files
Remove	Removes a selected WAV file that is displayed in gray.

Details: About WAV files

Discretes tab

The Discretes tab displays the list of discrete tags (and their values) referenced by the alarms and user defined menus. Tag names used in ScadaPhone must *exactly* match the tag names in the SCADA system, unless the tag is a computed tag. *See:* Computed Tags. In addition, ScadaPhone reserves the "$" symbol for predefined system tags. If the SCADA tag name happens to begin with "$", prefix the alarm tag name with two dollar signs: "$$".

ScadaPhone will poll the SCADA system for the values of these tags. Tags that are not referenced by any alarm or menu are displayed in gray. When the main menu **Options | Show System Info** option is checked, discrete system tag names are also visible on this tab. ScadaPhone does not poll the SCADA system for system tags. This tab has four buttons:

New	Opens a dialog box that allows entry of new tag names (development mode only).
Properties	Displays the properties of the selected tag (development mode only). *See*: Tag Properties
Invert	Inverts the value of the selected discrete tag (development and runtime).
Remove	Removes a selected discrete tag that is displayed as gray because it is not being used by any menu or alarm (development and runtime).
References	Displays all the places where this tag is used within the ScadaPhone project.

Note: The information on the Discretes tab may also be displayed in a separate window by selecting **Window | Discrete Tags**

Analogs tab

The Analogs tab displays the list of analog tags (and their values) referenced by the alarms and user defined menus. Tag names used in ScadaPhone must *exactly* match the tag names in the SCADA system, unless the tag is a computed tag. *See:* Computed Tags. In addition, ScadaPhone reserves the "$" symbol for predefined system tags. If the SCADA tag name happens to begin with "$", prefix the alarm tag name with two dollar signs: "$$".

ScadaPhone will poll the SCADA system for the values of these tags. Tags that are not referenced by any alarm or menu are displayed in gray. When the main menu **Options | Show System Info** option is checked, analog system tags are also visible, ScadaPhone does not poll the SCADA system for system tags. This tab has four buttons:

New	Creates new user defined menus (development mode only).
Properties	Displays the properties of the selected tag (development mode only). *See*: Tag Properties
Modify	Allows the value of the selected analog tag to be changed (development and runtime).
Remove	Removes a selected analog tag that is displayed as gray because it is not being used by any menu or alarm (development and runtime).
References	Displays all the places where this tag is used within the ScadaPhone project.

Note: The information on the Analogs tab may also be displayed in a separate window by selecting **Window | Analog Tags**

Strings tab

The Strings tab displays the list of string tags (and their values) referenced by the alarms and user defined menus. Tag names used in ScadaPhone must *exactly* match the tag names in the SCADA system, unless the tag is a computed tag. *See:* Computed Tags. In addition, ScadaPhone reserves the "$" symbol for predefined system tags. If the SCADA tag name happens to begin with "$", prefix the alarm tag name with two dollar signs: "$$".

ScadaPhone will poll the SCADA system for the values of these tags. Tags that are not referenced by any alarm or menu are displayed in gray. When the main menu **Options | Show System Info** option is checked, system string tags are also visible, ScadaPhone does not poll the SCADA system for system tags. This tab has four buttons:

New	Creates new user defined menus (development mode only).
Properties	Displays the properties of the selected tag (development mode only). *See*: Tag Properties
Modify	Allows the value of the selected string tag to be changed (development and runtime).

Remove	Removes a selected string tag that is displayed as gray because it is not being used by any menu or alarm (development and runtime).
References	Displays all the places where this tag is used within the ScadaPhone project.

The two remaining tabs are only visible if the main menu **Options | Show System Info** option is checked.

Sys Wavs tab

The Sys Wavs tab displays the list of system WAV files that are referenced by the system menus, user defined menus, and alarms. Filenames displayed in red indicate that the WAV file is referenced by an alarm or menu but does not exists on disk. A WAV filename displayed in red needs to be recorded. Filenames displayed in gray indicate WAV file that exists on disk but are not referenced by any alarms or menus. There are four buttons on this tab:

Record/ (Generate)	Allows the selected WAV file to be re-recorded (development mode only). **Note**: If the 'Text to Speech' option is selected, the **Record** button will change to **Generate**. Selecting an existing WAV file and clicking on the **Generate** button will generate a new WAV file replacing the selected WAV file. The new WAV file will use the currently selected voice; the voice speaks the name of the WAV file
Play	Plays the selected WAV file (development mode only).
Edit	Opens the Edit WAV File window loaded with the selected WAV file (development mode only). *See:* Editing WAV Files
Remove	Deletes a selected WAV file that is displayed in gray (development mode only).

Details: About WAV files

Sys Menus tab

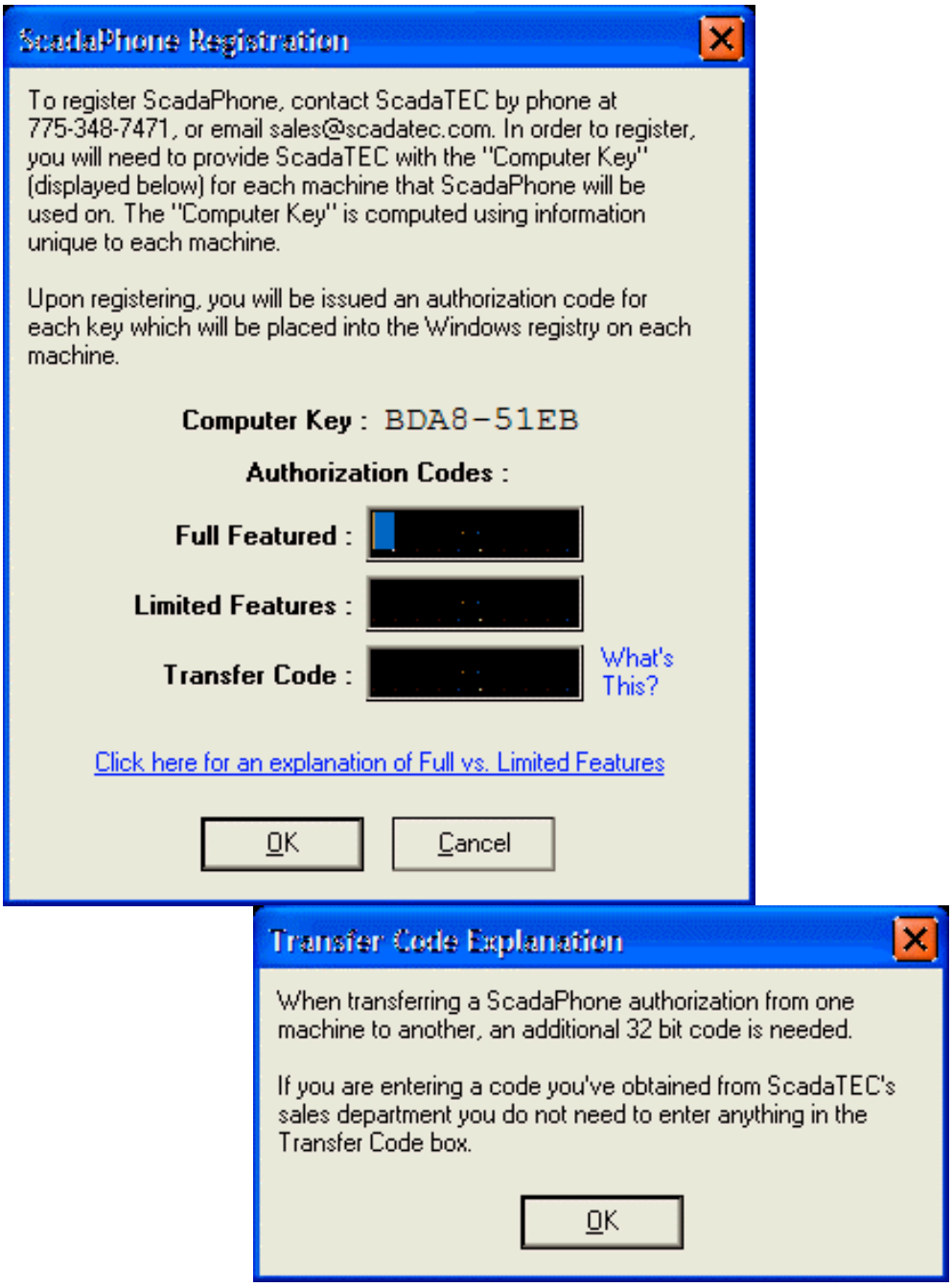
The Sys Menus tab gives access to the list of system menus. It is NOT recommended that the content of the system menus be modified, as it may adversely affect the performance of ScadaPhone. System menus may be re-recorded to change the voice to match other user-defined WAV files, but the message should stay the same. *See:* Editing WAV Files. If a needed WAV file is missing, ScadaPhone will create the default menu structure, but the missing WAV files will be displayed in red on the **Sys Wavs** tab. (Contact ScadaTec support for help restoring these files.) There are two buttons on the Menus tab:

Edit	Opens and loads the **Menu Information** window with the selected menu (development mode only).
Test	Plays the selected menu over the modem speaker or telephone (depending upon the settings selected in the main menu **Options | Modem Devices**) for testing purposes (development mode only).

Details: Creating and Editing Phone Menus

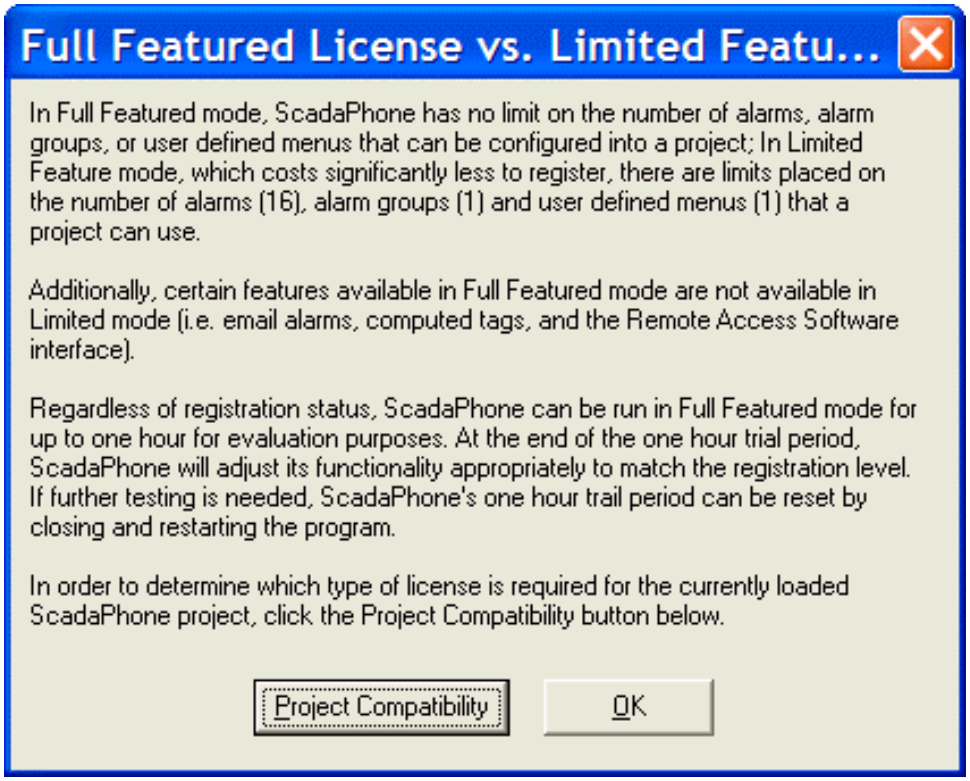
Registering ScadaPhone

ScadaPhone is available as a free trial version. The trial version will work in Run mode for one hour and then must be restarted. To eliminate this restriction and use ScadaPhone in your SCADA application, you must register by contacting SCADATEC's sales department. Upon registration, you will receive an authorization code. Depending on your needs, this authorization code will be for the full featured ScadaPhone system or for the limited ScadaPhoneLite system. This code must be entered into the correct ScadaPhone Registration text box. To open the registration window, select **File | Program | Register** from the main screen's menu bar.



As indicated in this window, a unique Identification number is generated on each PC. You will need this ID number when you call to register your copy of ScadaPhone. When the appropriate Authorization Code is entered, ScadaPhone is enabled to run indefinitely on the current PC as either the full featured or limited system. This registration may be transferred to another PC. ***See****:* Transfer Authorization Code

The following is the full vs. limited features screen.



Starting ScadaPhone

Note: The ScadaPhone installation program provides options to create desktop and/or start menu shortcuts.

To start ScadaPhone:

Double-click the desktop shortcut.

OR

use the start menu shortcut to ScadaPhone, by clicking **Start | Programs | ScadaTEC | Scadaphone *version* #**

OR

Use Windows Explorer to display the ScadaPhone.exe program and double-click program name.

Note: ScadaPhone will automatically restart if the amount of Windows memory used is greater than 3 times the baseline established one hour into the current run. This prevents ScadaPhone from gobbling up all of the available system memory and crashing the system due to unforeseen memory leaks and/or heap fragmentation. This is merely a precaution and is not expected to happen. ScadaPhone is rigorously tested for both memory leaks and heap fragmentation.

ScadaPhone_Projects

About WAV files

There are two types of WAV (sound) files in ScadaPhone:

1. WAV files recorded by the user
2. System WAV files that come with the ScadaPhone software. System WAV files may be re-recorded so that the voice matches other WAV files, but the content should remain the same. Changing system WAV files may adversely affect the performance of ScadaPhone.

User defined WAV files are displayed on the **WAV Files** tab. These WAV files are referenced by the user defined menus and alarms. Filenames displayed in red indicate that the WAV file is referenced by an alarm or menu but does not exists on disk. (The WAV file needs to be recorded.) Filenames displayed in gray indicate WAV files that exists on disk but are not referenced by any alarms or menus. There are five buttons on this tab:

New Opens the **Create New WAV file** dialog box. To create the WAV file, do the following steps:

1. Enter the name of the WAV file in the **File Name** edit box. **Note**: Do not enter a file extension. The extension '.WAV' will be added by ScadaPhone. It is recommended that the name of the WAV file be the same as the recorded text. If the **Text to Speech** option is used, this is mandatory. Example: If the WAV file contains the phrase, "Chlorine tank level low" the file name should be *ChlorineTankLevelLow*. ScadaPhone will append .WAV to the end of the file name. Spaces between the words are optional.
2. Click **Record**. ScadaPhone will display a pop-up box with a **Stop** button. When the pop-up box indicates recording is in progress, speak the desired message segment into the microphone.
3. Click **Stop** to end the recording. This will close the recording box and open the **Edit WAV file** window. The **Edit WAV file** window may be used to play back the WAV file and to eliminate beginning and ending pauses. *Details*: Editing WAV Files.
4. Click the **OK** button on the **Edit WAV file** window to save the WAV file and return to the main window.

Record Allows the re-recording of a selected WAV file. A dialog box will open asking confirmation of the overwrite. Click **Yes** to open the pop-up recording box. Click **Stop** to end the recording and to return to the main window.

Play Plays the selected WAV file.

Edit Opens the Edit WAV File window loaded with the selected WAV file. *Details*: Editing WAV Files

Remove Removes a selected WAV file that is displayed in gray.

System WAV files are displayed on the **Sys Wavs** tab. If the **Sys Wavs** tab is not visible, open the **Option** menu and select the **Show System Info** option. System WAV files are sound files referenced by the system menus, user defined menus, and alarms. Filenames displayed in red indicate that the WAV file is referenced by an alarm or menu but does not exists on disk. A WAV filename displayed in red needs to be copied from the ScadaPhone CD or the ScadaTEC website or re-recorded. Filenames displayed in gray indicate WAV file that exists on disk but are not referenced by any alarms or menus. There are four buttons on this tab:

Record Allows the re-recording of a selected WAV file. A dialog box will open asking confirmation of the overwrite. Click **Yes** to open the pop-up recording box. Click **Stop** to end the recording

and to return to the main window.

Play	Plays the selected WAV file.
Edit	Opens the Edit WAV File window loaded with the selected WAV file. *Details*: Editing WAV Files
Remove	Removes a selected WAV file that is displayed in gray.

WAV files may also be recorded when creating voice messages for alarms (*see:*Voice Message Composition) and message segments for phone menus (*see:* Menu Item Message Composition). In addition, new WAV files may be created from the **Edit WAV file** window. (*See:* Editing WAV Files.)

Technical Note

This note explains the options available for recording and playback of WAV files in ScadaPhone version 4.2.1.10 and above. It also provides some suggestions for getting the best sound quality.

Two options for recording and playback of WAV files are:

1. Through the voice modem.
2. Through the PC sound card.

There are other options such as using special software and hardware packages, but these will not be discussed in this note. If other methods of creating the WAV files are used, the resulting WAV files must be **16 bit monaural and recorded at 8K samples/sec**.

Which of the two above options will give the best sound quality depends on the following:

- Quality of the microphone
- Quality of the speaker(s). **Note**: The MultiTech modem uses an amplified speaker or it may be patched into the PC sound card 'Line' input to play through the PC speakers.
- Quality of the PC sound card.
- PC soundcard setup.

High quality recordings may be created using the MultiTech modem and microphone that is shipped with the ScadaPhone software. Recordings may also be created using the PC sound card. If both options are available, it is best to try both of them and see which works best with any given PC. Another possibility is that the best results will be obtained by recording via the modem on a development PC and using the PC sound card for playback on the production PC. Another option is to use a good quality stereo microphone/headphone combination. In any case, the following recording tips will be useful.

Controls and Options

The following controls and options are available:

1. Automatically adjust the recording volume:
   From the main menu, select **Options | Amplitude Adjustment** and check the **Auto Adjust Amplitude When Recording** checkbox.
2. Use the PC sound card:
   Select **Options | Audio Devices** from the main menu and check the Checkbox.
3. Adjust the modem playback volume level:
   Select **Modem | Volume** from the main menu and adjust the slider bar.
4. Adjust the sound card record and playback volume:
   Use the Windows volume control applet. From the Start menu, select **Programs | Accessories | Entertainment | Volume Control**'

Recording Tips

- Select a quiet area. Noise from the PC fan, hard disk, as well as other room noise is detrimental to recording quality. During playback there should be no ambient noise recorded during the

pauses between spoken words.

- Use a foam cover on the microphone to minimize the hisses and pops that are common during speech.
- Speak at a 90 degree angle to the microphone instead of directly into it.
- Speak clearly and distinctly with adequate volume.
- If using the modem for output, start by adjusting the modem volume to ¼ full volume. (From the ScadaPhone main menu select **Modem | Volume**.)
- If recording via the modem, start by leaving the **Options | Amplitude Adjustment - Auto Adjust Amplitude When Recording** Checkbox unchecked.
- If using the 'system' WAV files provided, try to match the recording level of the 'system' WAV files as closely as possible.
- The amplitude of one or more files may be adjusted after they are recorded in the 'Edit Wav File' form. However, boosting the level of a low volume WAV file will also boost any ambient background noise. It is better to record the WAV files with sufficient volume to begin with.

Acknowledging Alarms

There are three ways to acknowledge alarms in ScadaPhone: 1) Over the phone, 2) From the ScadaPhone application on the PC (console acknowledgement), and 3) From the SCADA application. ScadaPhone can also be configured so that when an alarm is acknowledged in the SCADA software ScadaPhone will consider the alarm to have been 'phone acknowledged'.

Alarm acknowledgement is configured when an alarm is defined in the **Alarm Information** window. (*See* Creating Alarm Tags and Messages.)

Phone Acknowledgement

To acknowledge an alarm from the phone, the user listens to the alarms and presses the proper keypad key to acknowledge the alarms individually or all active alarms at once. If the alarm requires only phone acknowledgement, ScadaPhone will stop trying to call contacts for the alarm.

If the alarm requires both console and phone acknowledgement, ScadaPhone will discontinue calling contacts for the period of time set by the **Ack Timeout** slider in the **Alarm Contact** window. (*See*: Entering Alarm Contact Information.) If this time expires and there has been no console acknowledgement, ScadaPhone will start calling contacts for the alarm again.

Acknowledging an alarm from the console always causes ScadaPhone to stop trying to phone contacts for that alarm unless the alarm clears and re-occurs. Of course, ScadaPhone will continue calling contacts for new or unacknowledged alarms.

ScadaPhone can also be configured so that when an alarm is acknowledged in ScadaPhone, it will set the acknowledge tag for the alarm to True in the SCADA software. This is accomplished by filling in the **Ack Tag Name** text box on the Alarm Information window. *See:* Ack Tag Name

Console Acknowledgement

Any alarm may be acknowledged from ScadaPhone at the PC. This is known as console acknowledgement. Console acknowledgement is accomplished by highlighting the alarm name(s) on the **Alarms** tab of the main ScadaPhone screen and clicking on the **Ack** button.

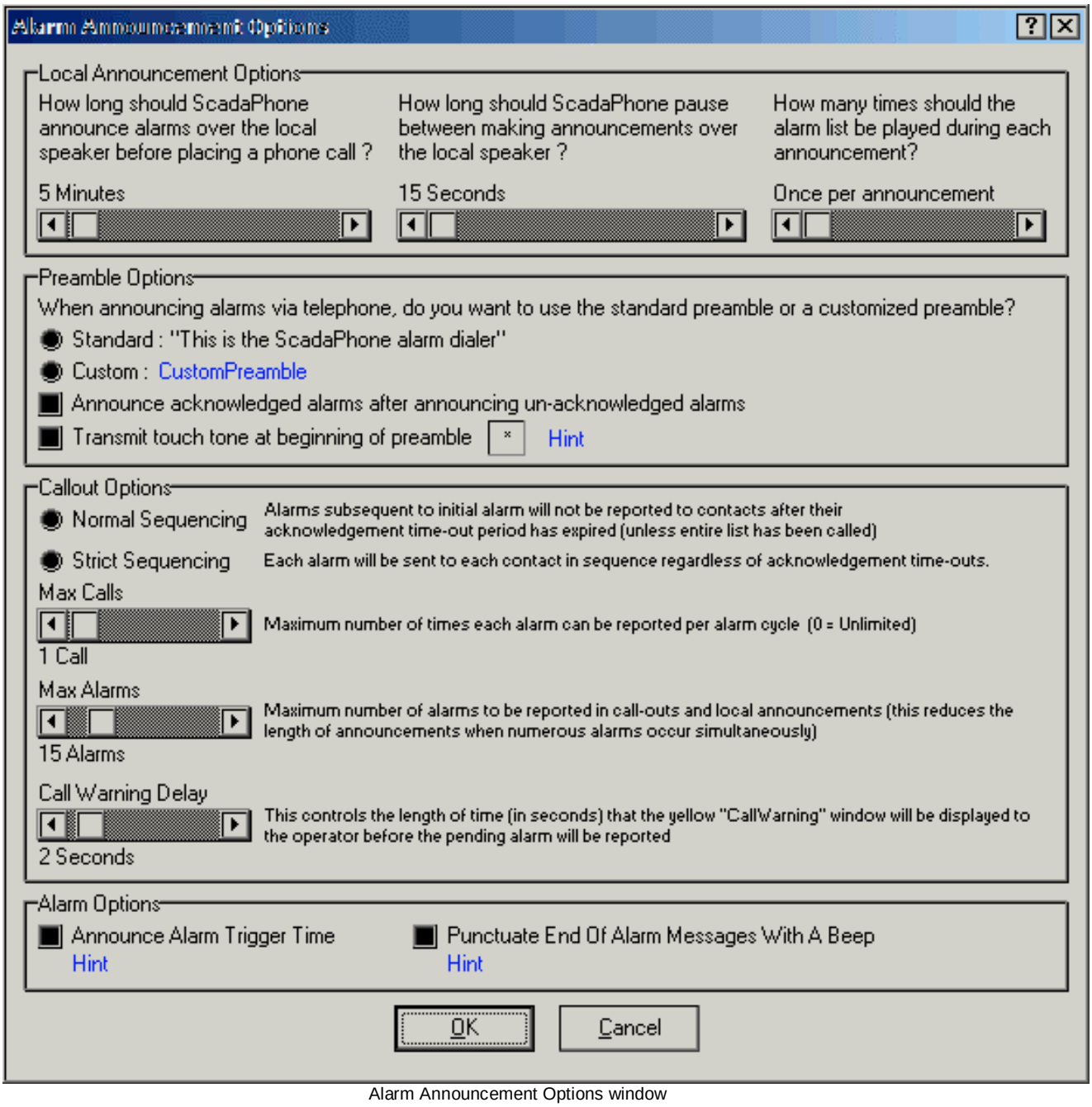
Any alarm can be acknowledged from the console, even if it has been configured for phone acknowledgment or for both phone and console acknowledgement. Once an alarm has been acknowledged from the console, ScadaPhone will not try to call any contacts for that alarm unless the alarm is cleared and re-occurs.

Acknowledgement from the SCADA application

If an acknowledge tag name is entered in the **Ack Tag Name** text box in the **Alarm Information** window, (*see:* Ack Tag Name), and the SCADA software sets this tag to 'True', ScadaPhone will consider the alarm to have been 'phone acknowledged'. If ScadaPhone is configured to require console acknowledgement as well as phone acknowledgement, then the alarm will still have to be acknowledged from the ScadaPhone software at the console. If this is not done within the period of time set by the **Ack Timeout** slider in the **Alarm Contact** window, then ScadaPhone will resume dialing contacts for the alarm. (*See*: Entering Alarm Contact Information.)

Alarm Announcement Options

The timing of alarm announcements as well as the preamble phase "The following alarms require acknowledgment" can be customized via the **Alarm Announcement Options** window. To open this window, select from the main screen's top menu **Options | Alarm Announcement**:



Alarm Announcement Options window

Scroll Bar Timing Settings

Adjust the three local announcement options scroll bars to set the following:

1. How long the alarms should be announced over the speaker before placing a telephone call
2. How long ScadaPhone should pause between announcing alarms
3. How many times the alarms should be announced during each announcement.

Custom Preamble

By default, ScadaPhone alarm announcements are introduced by the following WAV file: "*The following alarms require acknowledgment*". To create a custom preamble, click on the **Custom** radio button and

click on the blue CustomPreamble.wav link. (**Note**: Do not change this name.) Clicking on the CustomPreable.wav link opens the **Edit Wav File** dialog box. Click on the **Record** button, speak the new preamble message and click on the **Stop** button when done. *Details*: Editing WAV Files

Announce acknowledged alarms after announcing un-acknowledged alarms

Does just what it says.

Including a touch tone at the beginning of the preamble

In many telephone systems, calls that are not answered within a certain number of rings are automatically rolled over to voice mail. When this happens there is a voice prompt from the message service that tells the caller to "Leave a message after the beep...". Because ScadaPhone uses voice detection in determining when to start enunciating alarms, this voice prompt can trigger a premature alarm announcement before voice mail recording has begun. In some cases this can be avoided by configuring ScadaPhone to wait for a longer period of silence after a voice detection event and before playing the alarms. (***See***: MultipleScripts in the topic Creating and Editing Answer Detection Scripts.)

However, if the voice mail prompt contains unusually long periods of silence, the resulting answer detection script may cause annoyingly long periods of delay when the call is answered by a live contact. To avoid this, ScadaPhone can be configured to emit a "touch tone" that interrupts the voice mail prompt and switches the voice mail system into record mode immediately. To add this touch tone, select the **Transmit touch tone at beginning of preamble** option and click square button that follows this option. This opens the **Select Preamble Touch Tone** window. Select the key that corresponds to the tone to be transmitted. The number or character selected will be displayed in the square button.

Call-out Options

1. **Normal Sequencing** - Alarms subsequent to the initial alarm will not be reported to contacts after their acknowledgement time-out period has expired until the entire list of contacts has been called.
2. **Strict Sequencing** - Each alarm will be reported to each contact in sequence regardless of acknowledgement time-outs.
3. **Max Calls** - Sets the maximum number of times an alarm will be reported to each available contact. A counter is kept for each alarm for each available contact. This counter is set to zero each time the alarm goes false.
4. **Max Alarms** - This sets the maximum number of alarms that are reported to each call-out and announced locally. This can be used to reduce the length of alarm announcements.
5. **Call Warning Delay** - This sets how long the yellow alarm warning box is displayed before the alarm is announced or a call-out is made.

Alarm Options

Announce Alarm Trigger Time - When the Announce Alarm Trigger Time option is checked, each alarm announcement will start by stating the time the alarm triggered. For example:

Without trigger time option: "Tank 1 High Level"
With trigger time option: "12:46 AM Tank 1 High Level"

Punctuate End of Alarm Messages With a Beep - The Punctuate Alarm Message With A Beep option can be used to make sure that audio alarm announcements do not "run together" when played back-to-back. In some cases, the wav files recorded to announce an alarm may lack the proper inflection or "silence pad" at the end; in order to make the alarm messages unmistakably separate, ScadaPhone has this option so that at the end of every audio alarm announcement an audible

separator (i.e. a Beep) is inserted. For example:

If two or more alarms are being reported, their audio messages (WAV files) are played back-to-back:
Tank 1 High Level Pump 3 Power Fault Wet Well High Level"

If the Punctuate With A Beep option is checked, the message would be:
"Tank 1 High Level <BEEP>
Pump 3 Power Fault <BEEP>
Wet Well High Level <BEEP>"

This ensures that the contact will know that there are 3 separate alarms.

Alarm Groups

Alarms may be assigned to named groups, with different contacts assigned to each group. This allows different people to be called for different types of alarms, such as plant process alarms, building A/C alarms, security alarms, etc.

Alarm groups may be added or edited either in the **Alarm Information** window or the **Edit User** window. Contacts are assigned to an alarm group from the **Scheduler** window. By default, ScadaPhone has one alarm group named General and alarms and users are assigned to this group.

The **Alarm Information** window may be opened one of two ways:

1. Click on the **Alarms** tab on the main window, then click on the **New** button near the bottom of this window.

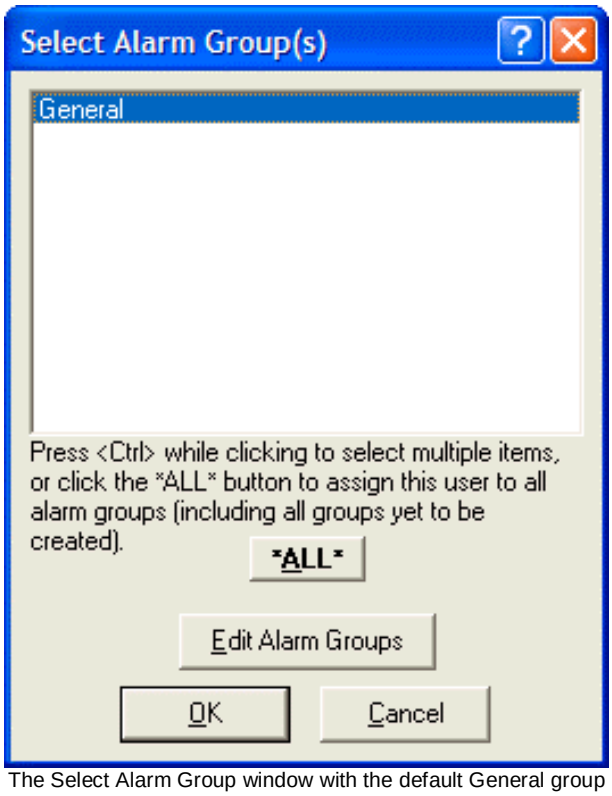
   OR

2. Select **Window | Alarms** from the main menu and click on the **New** button.

The Alarm Group information is on the left side of this window under the **Tag/Alarm Name**.

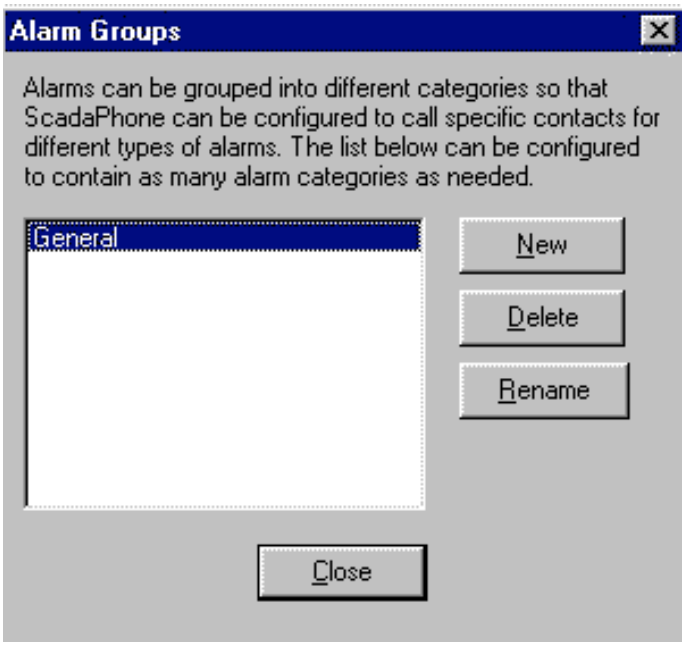
The **Edit User** window is opened by selecting the **Users** tab from the main window. Either click the **New** button or select a user and click the **Edit** button. The Alarm Group information is on the left side of this window under the **User Name**.

To select a different group, or to create a new group, remove a group, or change a group name, click on the blue alarm group link. This will open the **Select Alarm Group** window:



The Select Alarm Group window with the default General group

Click the **Edit Alarm Groups** button. This will open the **Alarm Groups** window:



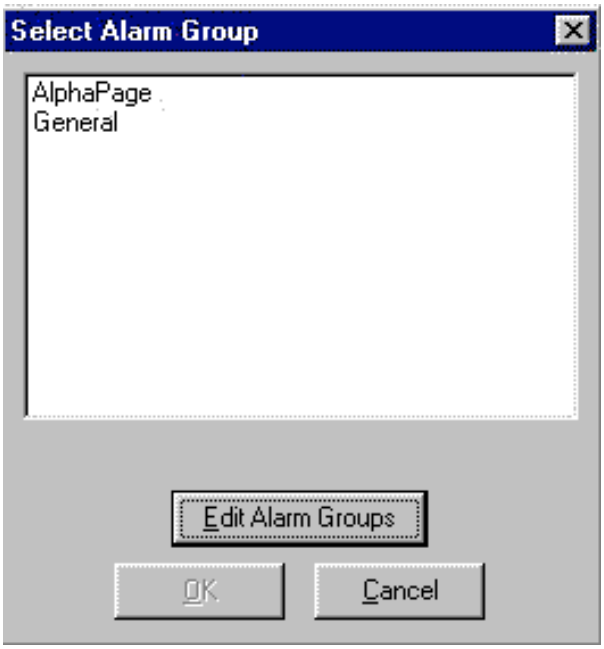
The Alarm Groups window

A new group name may be created by clicking the **New** button. Type the new name into the popup box and click the **OK** button. The new name will appear in the **Alarm Groups** window.

An existing group name may be deleted by selecting the group name and clicking the **Delete** button.

An existing group name may be edited by selecting the group name and clicking the **Rename** button. Type the new name into the popup box and click the **OK** button.

Click the **Close** button to return to the **Select Alarm Group** window:



The Select Alarm Group window with two groups

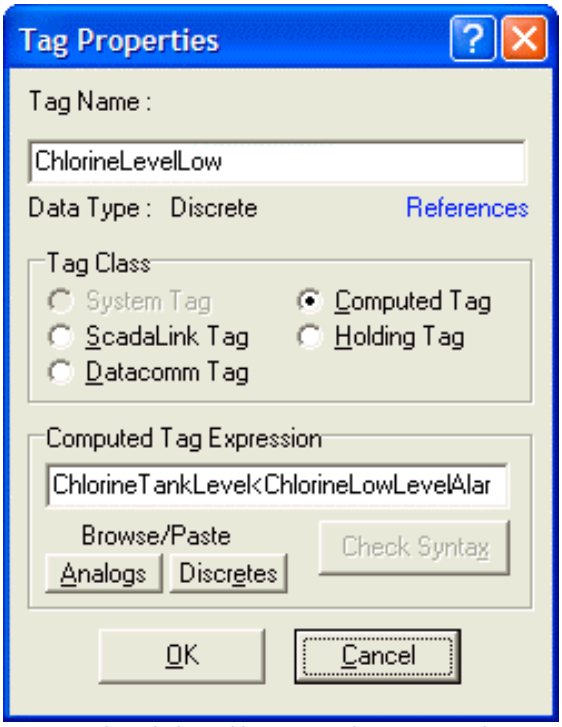
To assign the alarm to a new group, select the group name and click the **OK** button. ScadaPhone will return to the **Alarm Information** window. The blue Alarm Group link will display the new group name the Alarm or the User is assigned to.

Note: Users may be assigned to multiple groups. Press and hold the **CTRL** key down while selecting alarm group names to select multiple group names.

Computed Tags

Computed tags are tags that hold the value of a computation. This computation may be a discrete or analog expression involving literal values or other tags. Computed tags are added and edited in Development Mode.

Computed tags may be created by selecting the **Discrete**, **Analog**, or **String** tab on ScadaPhone's main screen. Create a new tag by clicking the **New** button. Select the tag name and open the **Tag Properties** window by clicking the **Properties** button. Select the **Computed Tag** option in the **Tag Class** panel. This will open a panel for entering computed tag expressions:



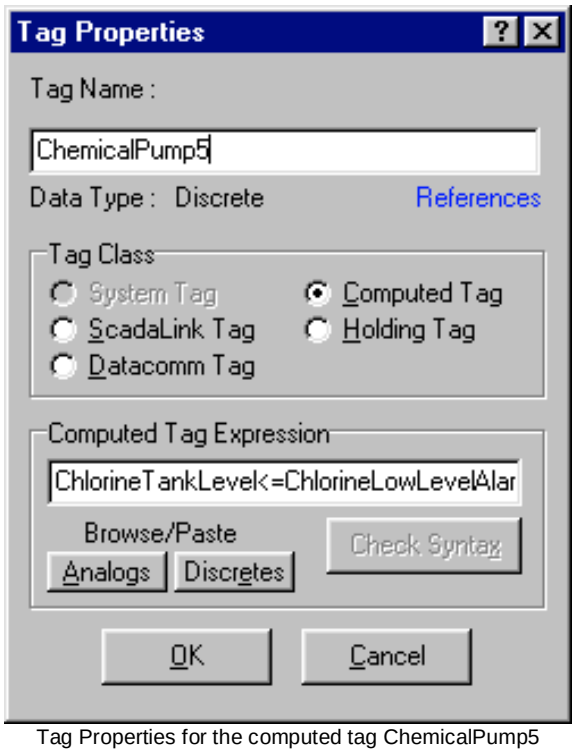
Tag Properties window with Computed Tag Expression panel

The tags used in the expression may be any tag name appearing on the **Discrete**, **Analog**, or **String** tabs. Analog and Discrete tag names may be entered using the Browse/Paste **Analogs** or **Discretes** buttons. The four basic math operators are entered using the standard symbols: + - * /. The following logical operators may also be entered: AND, OR, NOT, XOR, <>, =. See: **Math Operators** for a full list of math operators supported by ScadaPhone.

String tag names may also be entered by typing the tag name; there is no button to browse string names. Strings are concatenated with the '+' operator. String literals may also be added; these must be in double quotes.

If ScadaPhone detects an error in the computed tag expression, the expression will change to red and the **Check Syntax** button will be enabled. Click the button to see suggestions for correcting the syntax.

In the example below, a computed discrete tag named Chemical Pump5 is being created. This tag value will be TRUE when the value in the Analog tag named ChlorineTankLevel is less than or equal to the value of the Analog tag named ChlorineLowLevelAlarmSP:



Tag Properties for the computed tag ChemicalPump5

Click the **OK** button to return to the ScadaPhone main window. The computed tag name will appear on the tab panel and may be used as any other tag name.

Contact ScadaTec

To purchase a license and receive the unlock code for any of our products please call us at 888-722-3283. **Note**: You will need to have the product demo running or have the computer key generated by the product available when you call.

Creating a Schedule

About Scheduling

There are two types of scheduling that must be set up in ScadaPhone: **Action Scheduling** and **Contact Scheduling**. **Note:** The scheduling must be created for *each* Alarm Group. All scheduling is created in Development Mode.

Action Scheduling determines what action ScadaPhone will perform and at what time on specific days. This schedule may be based upon the time of day, day of week, or specific date. Each hour of the 24 hour schedule may be set to one of four actions, which will be triggered when alarms occur:

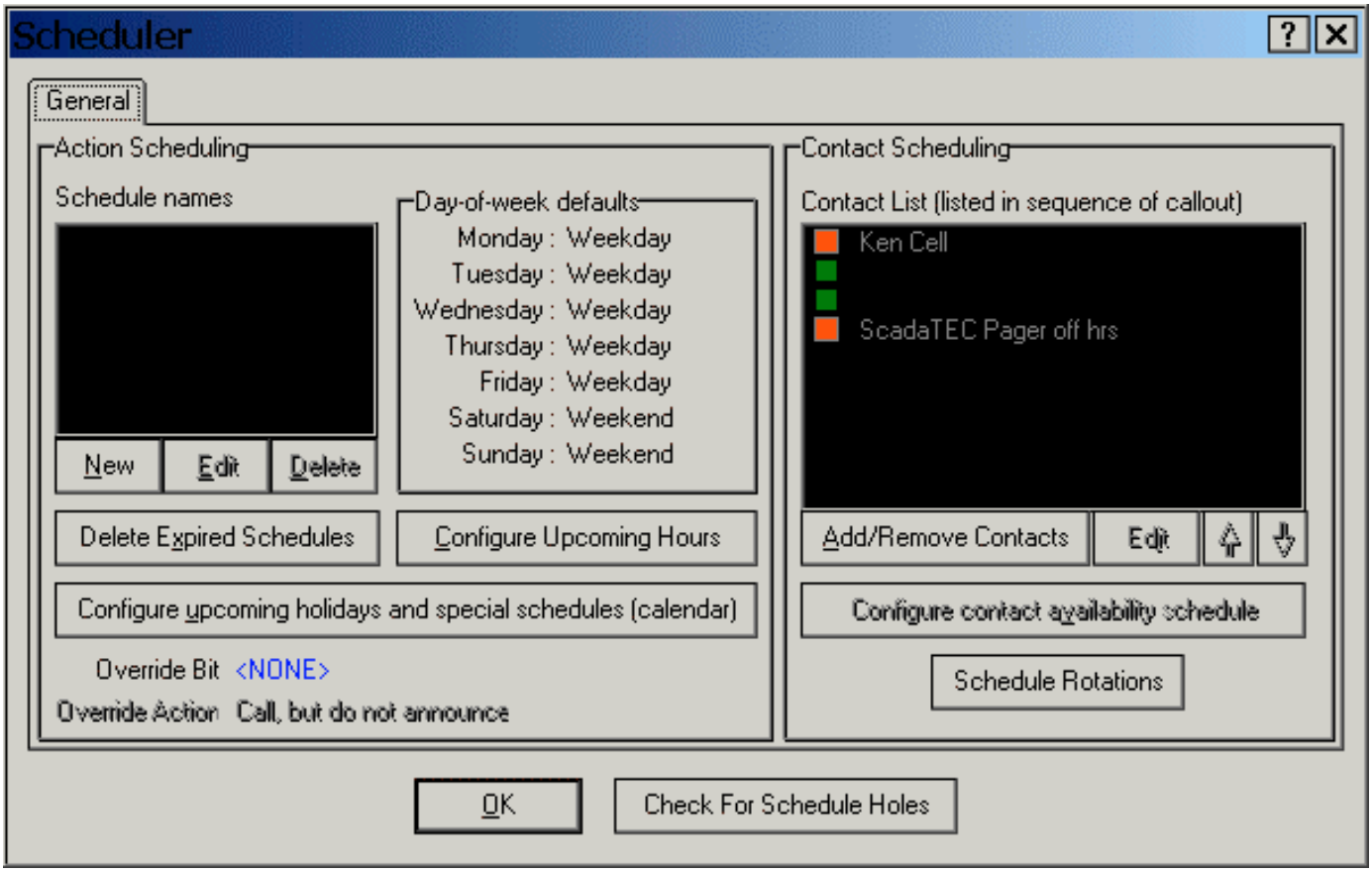
1. **Announce, then call**: Announces alarm messages over the modem speaker for a few minutes before dialing the phone number and performing the action as specified in the Alarm Contact window. This is used during business hours when system operators are likely to be in close proximity to the SCADA system, but also might be out of the office and only reachable by telephone or pager.

2. **Call but do not announce**: Immediately dials the phone number and performs the action as specified in the Alarm Contact window without playing alarm messages through the modem speaker. This is desirable during non-business hours when it is unlikely that anyone will be at the office.
3. **Announce but do not call**: Announces alarm messages over the modem speaker without time limit. This is useful if there are operators on duty 24 hours a day. This setting will insure that the operators are alerted to alarm conditions by the modem speaker if they are away from the SCADA console or viewing a screen that gives them no visual indication of active alarms.
4. **Do not announce, do not call**: This setting may be used during testing so that no calls are placed and no alarms are announced over the speakers.

Details: Action Scheduling

Contact Scheduling tells ScadaPhone which contacts are currently available. The **Contacts** tab in ScadaPhone's main window displays a list of who is to be contacted in the event of an alarm. By default, ScadaPhone assumes contacts are available 24 hours a day, seven days a week. To change this, each individual contact must have a schedule set up that specifies what hours they may be contacted. This schedule may be based upon the time of day, day of week, or specific date. Each hour of the 24 hour schedule may be set to one of two actions, either the contact is available or is not available. *Details:* Contact Scheduling

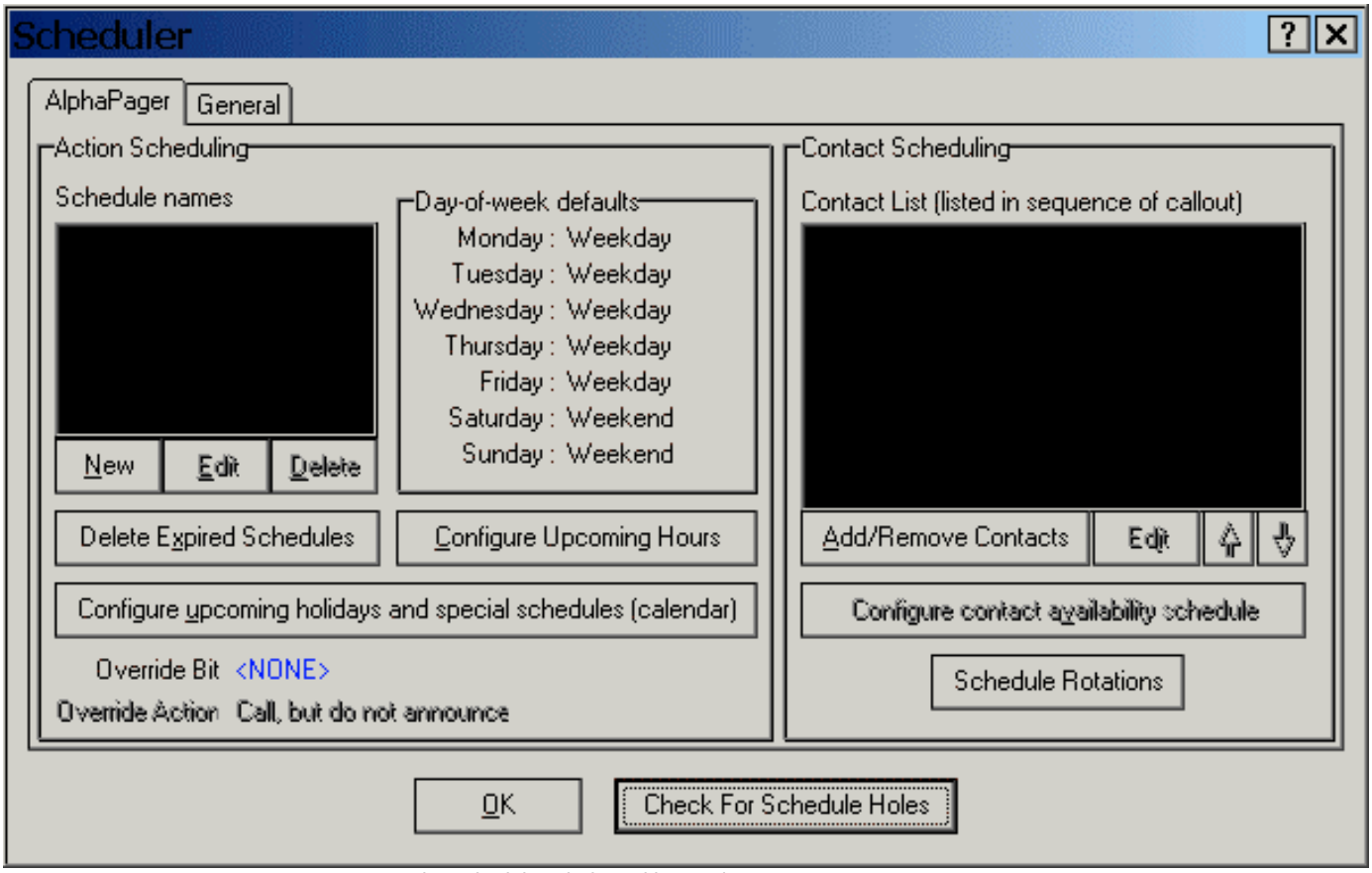
Both **Action Scheduling** and **Contact Scheduling** are set up from the **Scheduler** window. To open the **Scheduler** window, select **Scheduler** from the main screen's top menu:



The default Scheduler window

The above example shows the **Scheduler** window with one tab named **General**. The **General** tab corresponds to the **General** alarm group. If there is more than one alarm group, the **Scheduler** window

will have one tab for each alarm group. For example, if the ScadaPhone system had a second alarm grouped named "AlphaPage", the **Scheduler** window would appear as follows:



The Scheduler window with two alarm groups

Note: Be sure to select the correct Alarm Group tab when setting up scheduling.

The Scheduler window consists of two panes, **Action Scheduling** and **Contact Scheduling**.

Action Scheduling

The left pane of the **Scheduler** window is named **Action Scheduling**. **Action Scheduling** is used to set up what action ScadaPhone will perform and at what time on specific days. The left part of this pane contains a list box called **Schedule names**. The **Schedule names** list displays defined schedules. Existing schedules may be edited and new ones created. The right part of the **Action Scheduling** pane contains a panel called **Day-of-week defaults**. When ScadaPhone is first started, it has two default schedules, *Weekday*, which is assigned to Monday-Friday, and *Weekend*, which is assigned to Saturday and Sunday.

Schedule names

The left part of the **Action Scheduling** pane contains a list box called **Schedule names**. The **Schedule names** list displays defined schedules. ScadaPhone starts with two predefined schedules, *Weekday* and *Weekend*. The default *Weekday* schedule is set to "Announce, then call" for the hours between 8:00 a.m. and 5:00 p.m. The remaining hours of the weekday are set to "Call but do not announce." The default *Weekend* schedule is set to "Call but do not announce" for the whole 24 hour period. These schedules may be edited and new schedules created as needed.

Creating New Schedules

To create a new schedule, first click the correct Alarm Group tab in the **Scheduler** window. Next, click the **New** button under the **Schedule names** list box. This will open the **Callout Schedule** grid window. *See:* Using the Callout Schedule Grid. Once a new schedule is created, the name will be listed in the **Schedule names** box. After the schedule is created, it may be assigned to the appropriate day of the week.

Editing Schedules

To edit a schedule, highlight the schedule name in the **Schedule names** list box in the **Scheduler** window and click the **Edit** button. This will open the **Callout Schedule** grid window. *See:* Using the Callout Schedule Grid

Assigning Schedules to the Day-of-Week

The **Day-of-week** box to the right of the **Schedule names** list in the **Scheduler** window is used to assign a schedule (from the **Schedule names** list) to each day of the week. Before a schedule will be run, it must be assigned to a day of the week. Change a day-of-week setting by highlighting a schedule in the **Schedule names** list and then clicking the day-of-week label. The setting will change to the highlighted schedule.
Note: Special schedules may be created using the **Configure Upcoming Hours** and the **Configure Upcoming Holidays and Special Schedules** buttons. These schedules are run automatically and do not need to be assigned to a day of the week.

Creating a Schedule for the Next 24 Hours

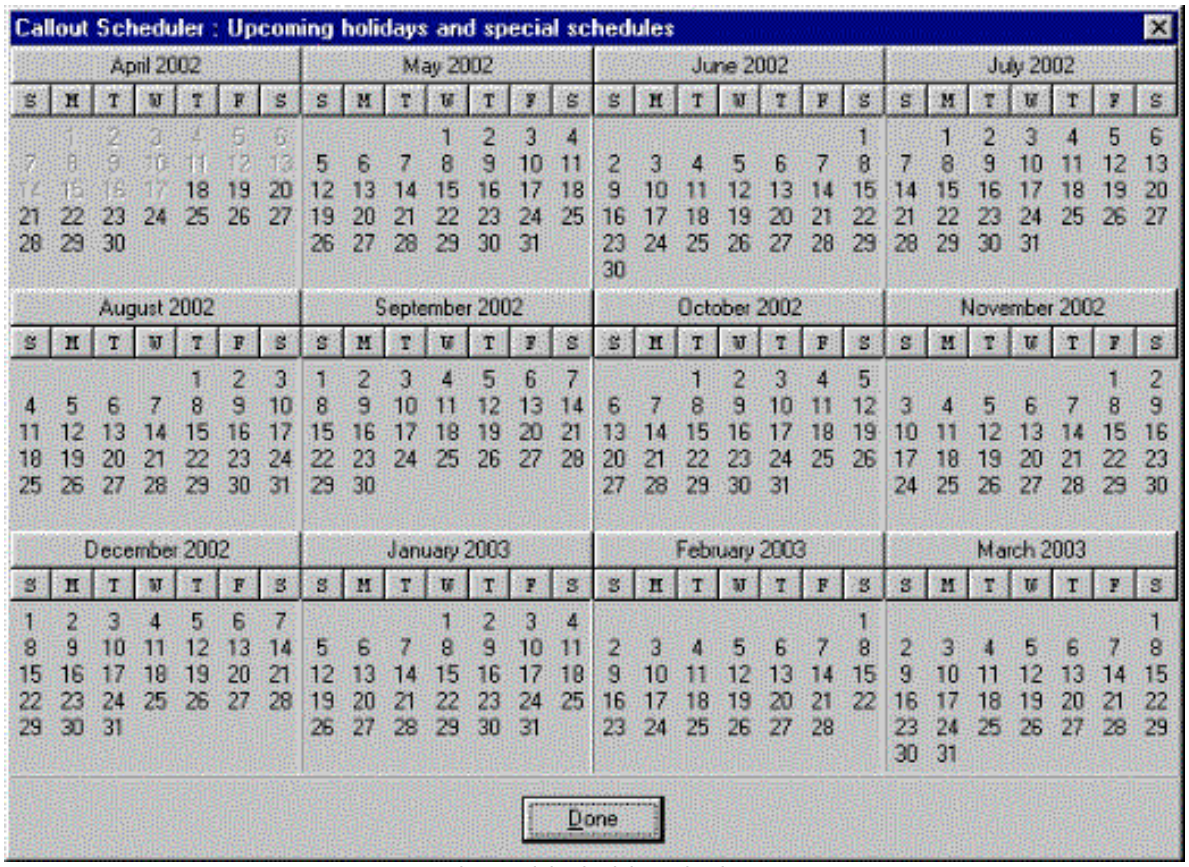
A schedule may be created for the next 24 hours period. To create a 24-hour schedule, first click the correct Alarm Group tab in the **Scheduler** window. Next, click on the **Configure Upcoming Hours** button below the **Day-of-week defaults** panel. This will open the **Callout Schedule** grid window. *See:* Using the Callout Schedule Grid.

When the 24-hour schedule is created, ScadaPhone will display the name(s) in the **Schedule names** box in the format *year-month-day(nameofday)*. Usually a 24-hour schedule will consist of two schedule names, each covering part of a day. For example, a 24-hour schedule running from 8:00 a.m. on Jan 1, 2003 to 8:00 a.m. on Jan. 2, 2003 will be displayed in the **Schedule names** box as "2003-01-01(Weds)" and "2003-01-02(Thurs)." The 2003-01-01(Weds) schedule covers the hours 8:00 a.m. to midnight and the 2003-01-02(Thurs) schedule covers the hours from midnight to 8:00 a.m. This schedule is run automatically during the scheduled time period, instead of the day-of-the-week schedule.

When a 24-hour schedule has expired, it may be removed by clicking the **Delete Expired Schedules** button

Creating Special Schedules

Special schedules may be created for upcoming days such as holidays. To create a special schedule, first click the correct Alarm Group tab in the **Scheduler** window. Next, click on the **Configure upcoming holidays and special schedules** button. This will open the special schedules calendar:



The special schedules calender

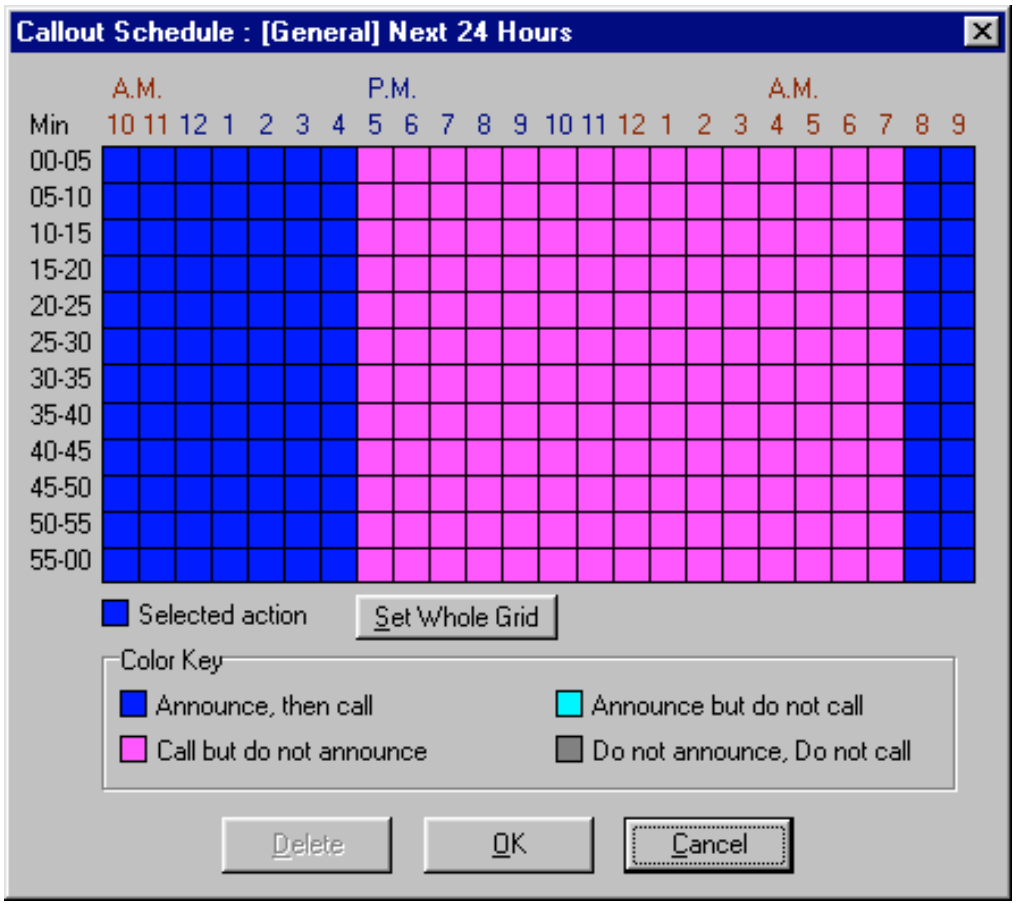
Click on the date for the upcoming special schedule. This will open the **Callout Schedule** grid window. *See:* Using the Callout Schedule Grid. When the schedule grid is completed, click on the **OK** button to return to the calendar. Click on another date or click the **Done** button if finished.

A special schedule will be entered into the **Schedule names** box of the **Scheduler** window in the format *year-month-day(nameofday).* For example, a special schedule might appear as follows: 2003-01-03(Fri). This schedule is run automatically during the scheduled time period, instead of the day-of-the-week schedule.

After special schedules dates have passed, click on the **Delete Expired Schedules** button to remove them.

Using the Callout Schedule Grid

The Callout Schedule Grid window is opened from the **Scheduler** window whenever a new schedule is created or an existing schedule is edited:



The callout schedule grid

The Callout Schedule Grid consists of 288 (24 X 12) cells that represent a 24-hour day divided into 5-minute time slices. The grid columns represent hours, the grid rows represent 5-minute intervals. Each cell in the grid can be set to one of four states:

1. **Announce, then call**: Announces alarm messages over the modem speaker for a few minutes before dialing the phone number and performing the action as specified in the Alarm Contact window. This is used during business hours when system operators are likely to be in close proximity to the SCADA system, but also might be out of the office and only reachable by telephone or pager.
2. **Call but do not announce**: Immediately dials the phone number and performs the action as specified in the Alarm Contact window without playing alarm messages through the modem speaker. This is desirable during non-business hours when it is unlikely that anyone will be at the office.
3. **Announce but do not call**: Announces alarm messages over the modem speaker without time limit. This is useful if there are operators on duty 24 hours a day. This setting will insure that the operators are alerted to alarm conditions by the modem speaker if they are away from the SCADA console or viewing a screen that gives them no visual indication of active alarms.
4. **Do not announce, do not call**: This setting may be used during testing so that no calls are placed and no alarms are announced over the speakers.

To set cell states, click the desired color swatch in the **Color Key** box. The selected color swatch will be displayed in the **Selected action** color swatch. Click on the **Set Whole Grid** button to set the entire 24 hour period to the **Selected action** color. Click a column heading to set an entire hour to the **Selected action** color. Click on an individual cell or click and drag to set individual cells to the **Selected action** color.

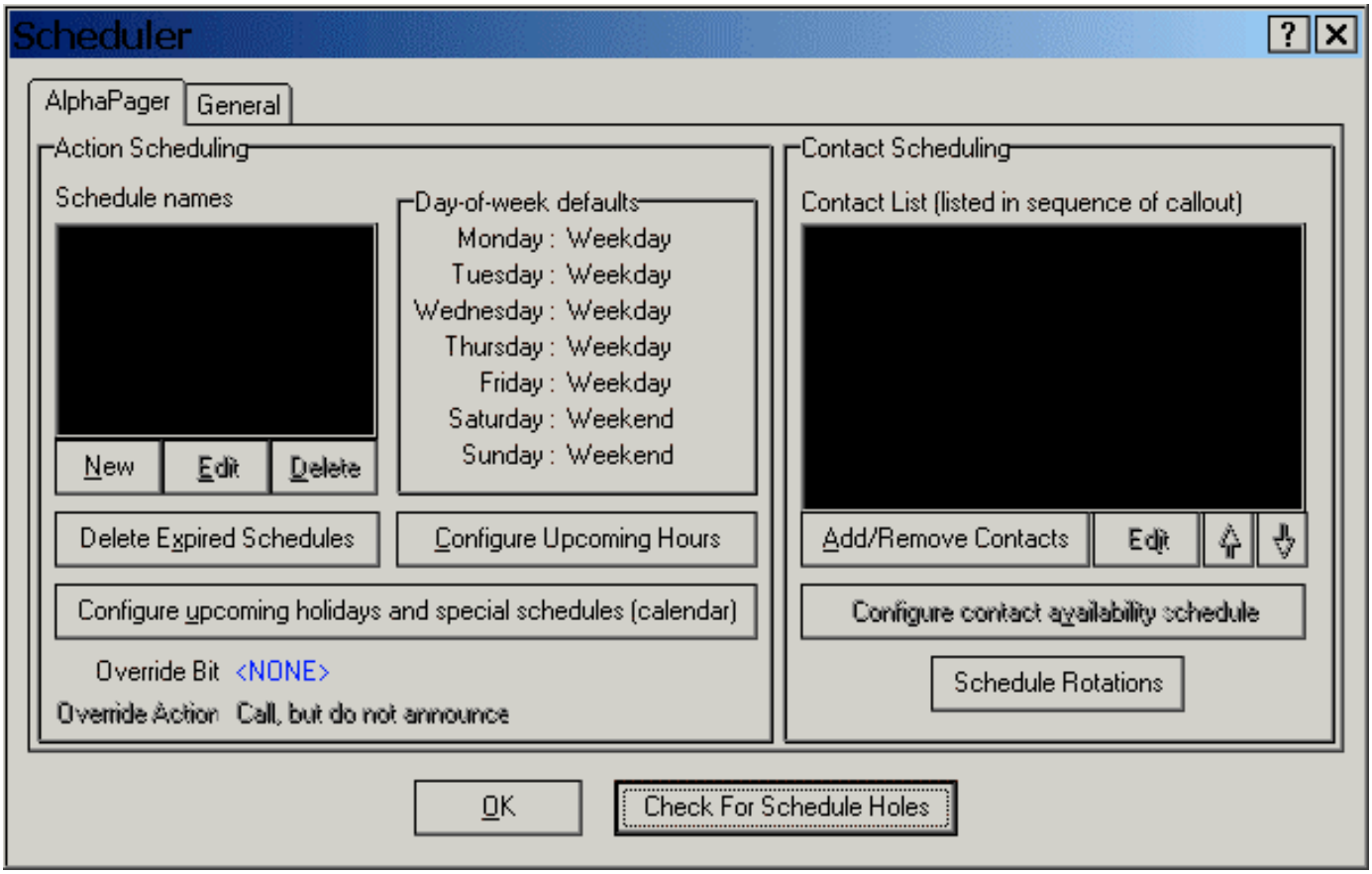
To save the schedule, click on the **OK** button. To exit a schedule without saving, click on the **Cancel** button. To remove a previously saved schedule, click on the **Delete** button.

Deleting Schedules

To remove a schedule listed in the **Schedule names** box in the **Scheduler** window, select the name and click the **Delete** button. Expired special schedules and 24-hour schedules may be deleted by clicking the **Delete Expired Schedules** button.

Contact Scheduling

The right pane of the **Scheduler** window is named **Contact Scheduling**. To open the Scheduler window, click **Scheduler** from the main screen's top menu:



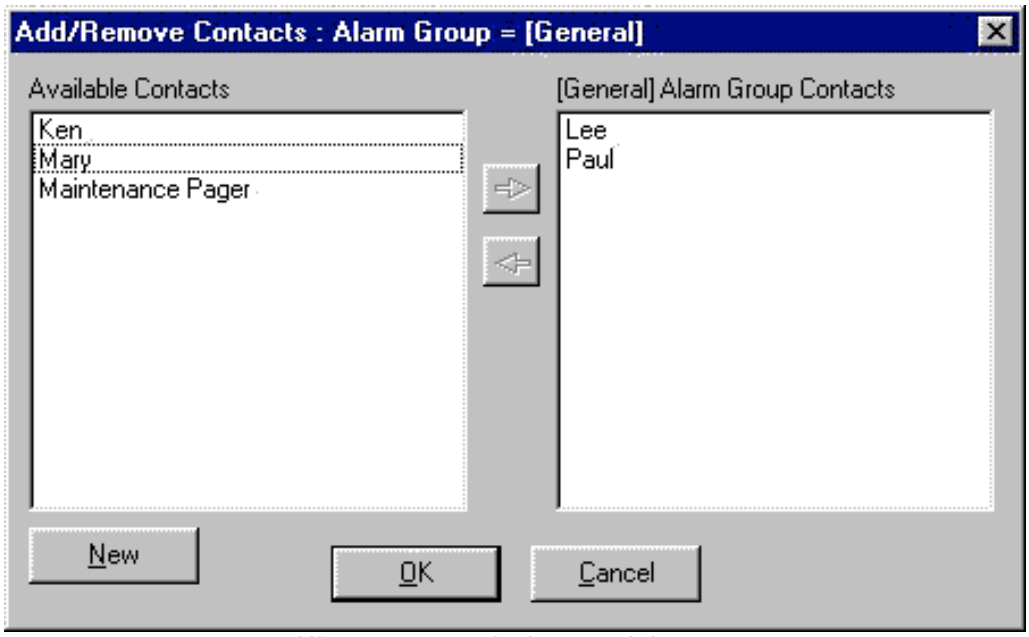
The Scheduler window with two alarm groups

Contact Scheduling is used to set up the list of whom ScadaPhone is to contact in the event of an alarm. Each individual contact must have a schedule set up that specifies what hours they may be contacted. The **Contact List** box displays the name of the contacts in the order they will be contacted. The next contact to be called is highlighted with an icon to the left of the name. If a contact has not been enabled, or their schedule makes them unavailable, the icon to the left of the name will be red and the name grayed out.

When working with contacts, be sure to select the appropriate Alarm Group tab in the **Scheduler** window. If a contact is assigned to more than one alarm group, the contact's schedule set up for one alarm group will not affect their schedule for a different alarm group.

Adding or Removing Contacts

To add or remove a contact to or from the **Contact List** box, first click the correct Alarm Group tab in the **Scheduler** window. Next, click the **Add/Remove Contacts** button. This will open the **Add/Remove Contacts** window:



Add/Remove contacts for the General alarm group

This window displays the contacts defined on the main window's **Contact** tab. *See:* Entering Alarm Contact Information. Contacts that have already been scheduled to be called appear in the left pane. Contacts not yet assigned and that are available appear in the right pane. To move a contact from one pane to the other, highlight the contact name and click the right or left arrow button.

To create a new contact, click the **New** button. This will open the Alarm Contact window. *See:* Entering Alarm Contact Information. Enter the new contact information and click **OK**. The new contact will be listed in the Available Contacts pane and also will be entered on the main window's **Contact** tab.

When finished adding or removing contacts, click the **OK** button to return to the **Scheduler** window.

Editing Alarm Contact Information

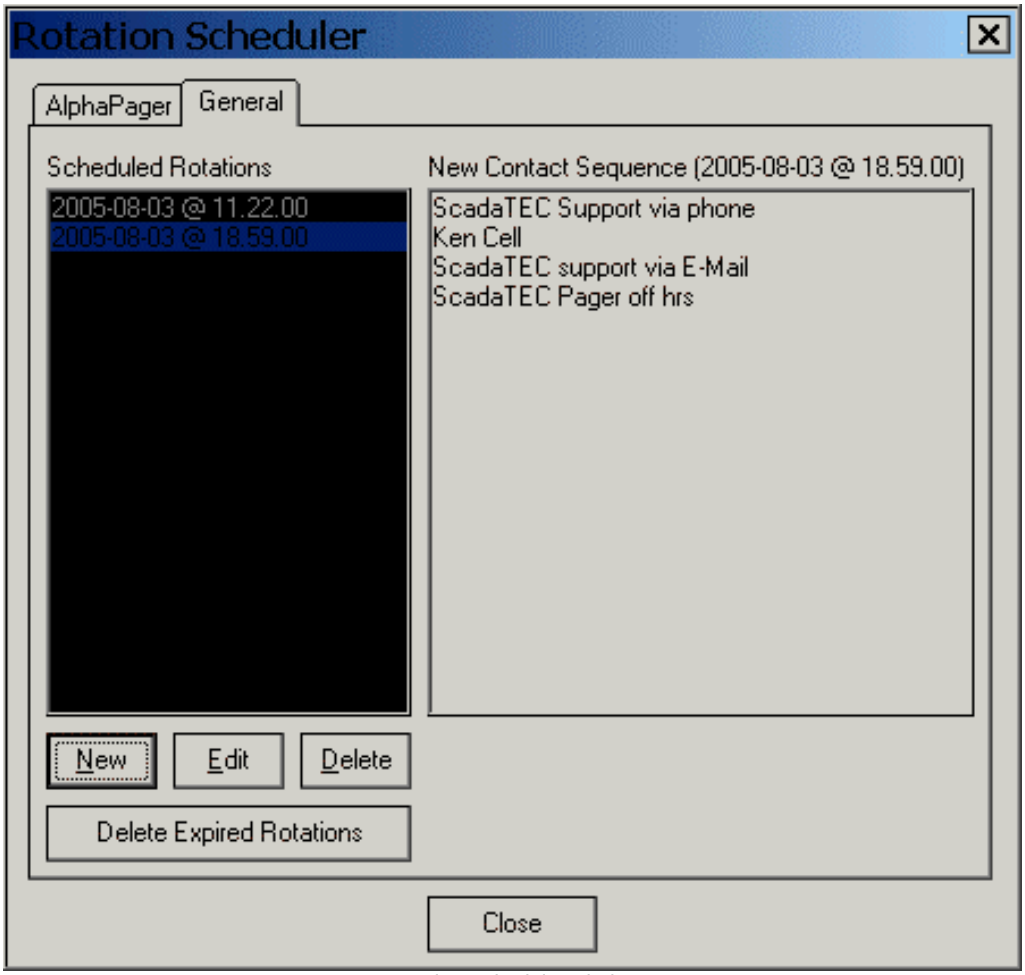
Each contact displayed in the **Contact List** pane in the **Scheduler** window has previously defined data, such as the telephone number to dial, call persistence settings, and answer detection scripts. This information may be edited by clicking the **Edit** button. This will open the Alarm Contact window. *See:* Entering Alarm Contact Information. Edit the contact information and click **OK**. ScadaPhone will return to the **Scheduler** window.

Changing the Contact Order

When alarms trigger, ScadaPhone will continuously cycle through the list of contacts displayed in the **Contact List** pane in the **Scheduler** window until someone acknowledges the active alarm(s). The contacts will be called in the order they are displayed in the list, starting from top to bottom. The contact list may be reordered either manually, by clicking on the name of the contact and then click on the up or down arrows to move the contact up or down in the list, or automatically based on a user defined schedule rotation .

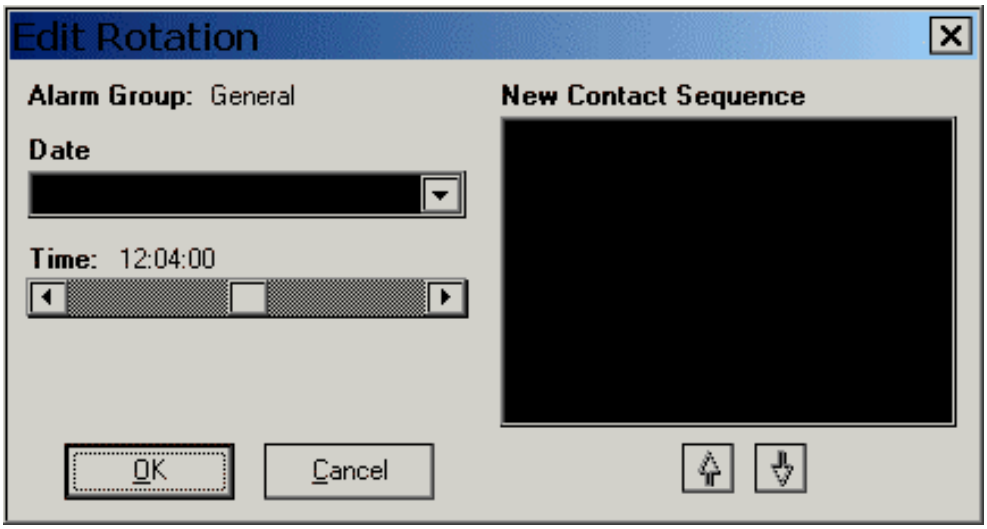
Setting up Schedule Rotations

To set up automatic schedule rotations to reorder the contact list at on a given day and time, click the 'Schedule Rotations' button on the scheduler screen. This will bring up the following window.



Rotation Scheduler window

To setup a new contact sequence and set the date and time for the new sequence to occur, click the 'New' button. To edit an existing Scheduled Rotation. click the 'Edit' button. Either of these actions will display the following window.
NOTE: Be sure to select the desired alarm group tab first.



Edit Rotation window

Select the date and time for the new contact sequence to occur. Reorder the contact sequence as desired by selecting a name and clicking the up or down buttons. Click the 'OK' button.

NOTES: If ScadaPhone is in 'Run' mode the contact sequence will be automatically changed to the new sequence at each scheduled rotation. The new sequence will exist until the next scheduled rotation or is changed manually. If the contact list is reordered manually in the scheduler window after adding one or more scheduled rotation, the following window will be displayed.

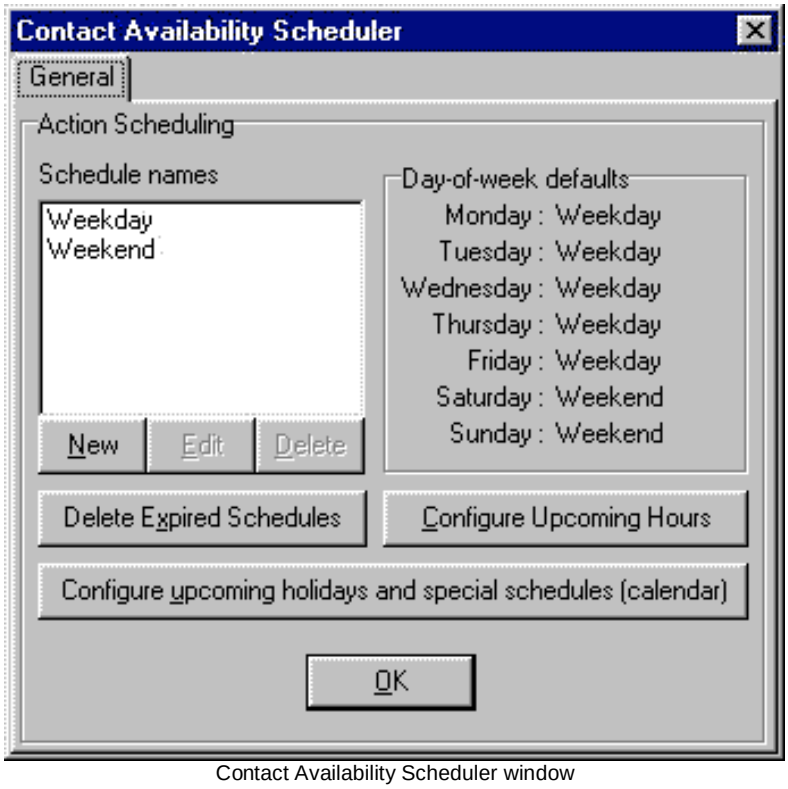
Contact Rotation Sequence Mismatch window

This window allows various options as described. Click on the desired button.

Setting up the Contact Schedule

By default, ScadaPhone assumes contacts are available 24 hours a day, seven days a week. To change this, each individual contact must have a schedule set up that specifies what hours they may be contacted. To set up the contact's schedule, first select the appropriate Alarm Group tab in the Scheduler window. If a contact is assigned to more than one Alarm Group, the contact's schedule created for one alarm group will not affect their schedule for a different alarm group.

Next, click the name of the contact in the **Contact list** box and click the **Configure contact availability schedule** button. This will open the **Contact Availability Scheduler** window:



Contact Availability Scheduler window

Using the Contact Availability Scheduler Window

The Contact Availability Scheduler window is almost identical to the left **Action Scheduling** pane in the **Scheduler** window. The difference is that the **Contact Availability Scheduler** window is used to set up when a specific contact is available, whereas the **Action Scheduling** pane determines what action ScadaPhone will perform and at what time on specific days. The left part of the **Contact Availability Scheduler** window contains a list box called **Schedule names**. The **Schedule names** list displays defined schedules. Existing schedules may be edited and new ones created. The right part of the **Contact Availability Scheduler** window contains a panel called **Day-of-week defaults**. Each contact has two default schedules, *Weekday*, which is assigned to Monday-Friday, and *Weekend*, which is assigned to Saturday and Sunday. However, the two default schedules are identical--both make a contact available 24 hours a day. The schedules may be edited as needed.

Creating New Contact Schedules

To create a new contact schedule, click the **New** button under the **Schedule names** list box in the **Contact Availability Scheduler** window. This will open the **Contact Schedule** grid window. *See:* Using the Contact Schedule Grid. Once a new schedule is created, the name will be listed in the **Schedule names** box. After the schedule is created, it may be assigned to the appropriate day of the week.

Editing Contact Schedules

To edit a contact's schedule, highlight the schedule name in the **Schedule names** list box in the **Contact Availability Scheduler** window and click the **Edit** button. This will open the **Contact Schedule** grid window. *See:* Using the Contact Schedule Grid.

Assigning Contact Schedules to the Day-of-Week

The **Day-of-week** box to the right of the **Schedule names** list in the **Contact Availability Scheduler** window is used to assign a schedule (from the **Schedule names** list) to each day of the week. Before a schedule will be run, it must be assigned to a day of the week. Change a day-of-week setting by highlighting a schedule in the **Schedule names** list and then clicking the day-of-week label. The setting will change to the highlighted schedule.

Note: Special schedules may be created using the **Configure Upcoming Hours** and the **Configure Upcoming Holidays and Special Schedules** buttons. These schedules are run automatically for the contact and do not need to be assigned to a day of the week.

Creating a Contact Schedule for the Next 24 Hours

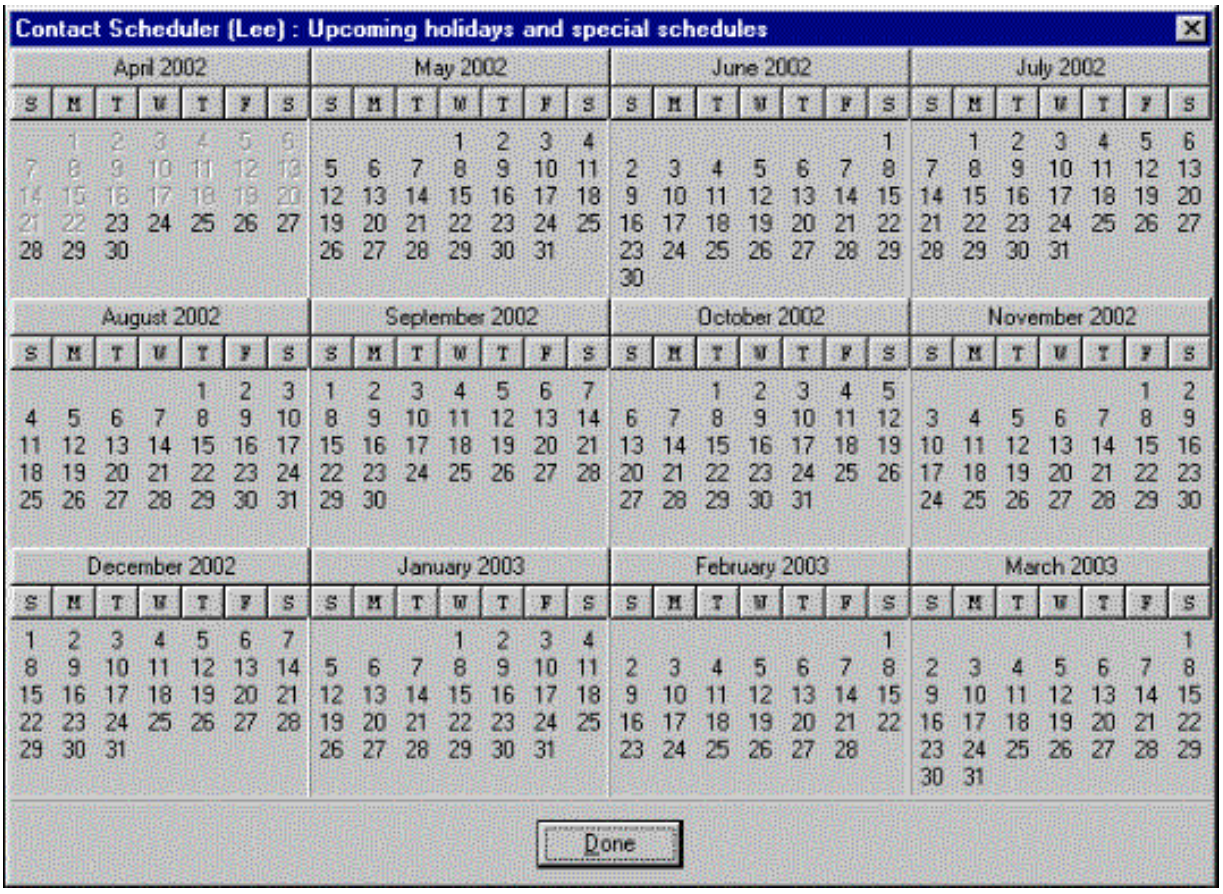
A schedule may be created for the next 24 hours period. To create a 24-hour schedule, click on the **Configure Upcoming Hours** button below the **Day-of-week defaults** panel in the **Contact Availability Scheduler** window. This will open the **Contact Schedule** grid window. *See:* Using the Contact Schedule Grid.

When the 24-hour schedule is created, ScadaPhone will display the name(s) in the **Schedule names** box in the format *year-month-day(nameofday)*. Usually a 24-hour schedule will consist of two schedule names, each covering part of a day. For example, a 24-hour schedule running from 8:00 a.m. on Jan 1, 2003 to 8:00 a.m. on Jan. 2, 2003 will be displayed in the **Schedule names** box as "2003-01-01(Weds)" and "2003-01-02(Thurs)." The 2003-01-01(Weds) schedule covers the hours 8:00 a.m. to midnight and the 2003-01-02(Thurs) schedule covers the hours from midnight to 8:00 a.m. This schedule is run automatically for the contact during the scheduled time period, instead of the day-of-the-week schedule.

When a 24-hour schedule has expired, it may be removed by clicking the **Delete Expired Schedules** button

Creating Contact Special Schedules

Special schedules may be created for upcoming days such as holidays. To create a special schedule, click on the **Configure upcoming holidays and special schedules** button in the **Contact Availability Scheduler** window. This will open the special schedules calendar:



Click on the date for the upcoming special schedule. This will open the **Contact Schedule** grid window. *See:* Using the Contact Schedule Grid. When the schedule grid is completed, click on the **OK** button to return to the calendar. Click on another date or click the **Done** button if finished.

A special schedule will be entered into the **Schedule names** box of the **Contact Availability Scheduler** window in the format *year-month-day(nameofday).* For example, a special schedule might appear as follows: 2003-01-03(Fri). This schedule is run automatically for the contact during the scheduled time period, instead of the day-of-the-week schedule.

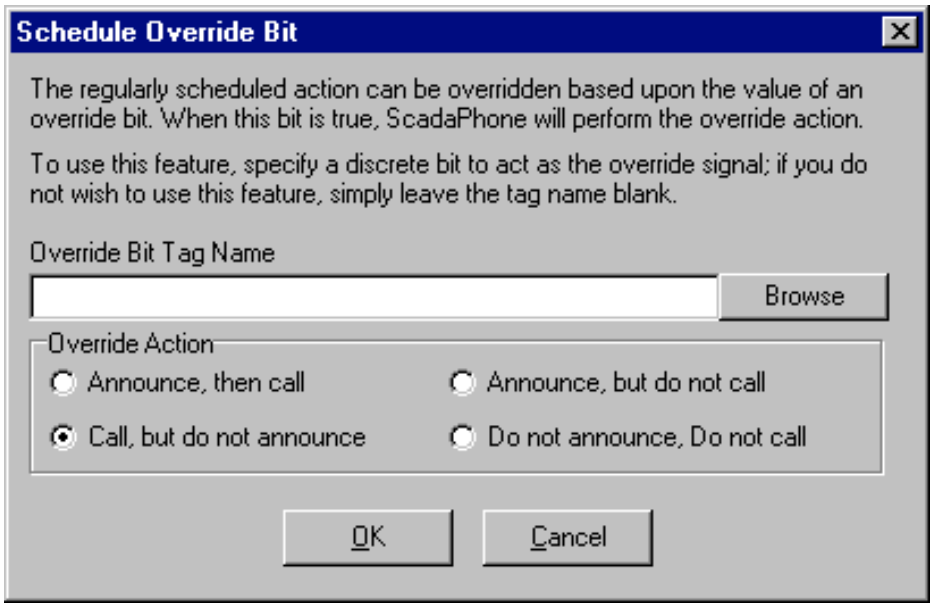
After special schedules dates have passed, click on the **Delete Expired Schedules** button to remove them.

Deleting Contact Schedules

To remove a schedule, highlight the schedule name in the **Schedule names** list box in the **Contact Availability Scheduler** window and click the **Delete** button. Expired special schedules and 24-hour schedules may be deleted by clicking the **Delete Expired Schedules** button.

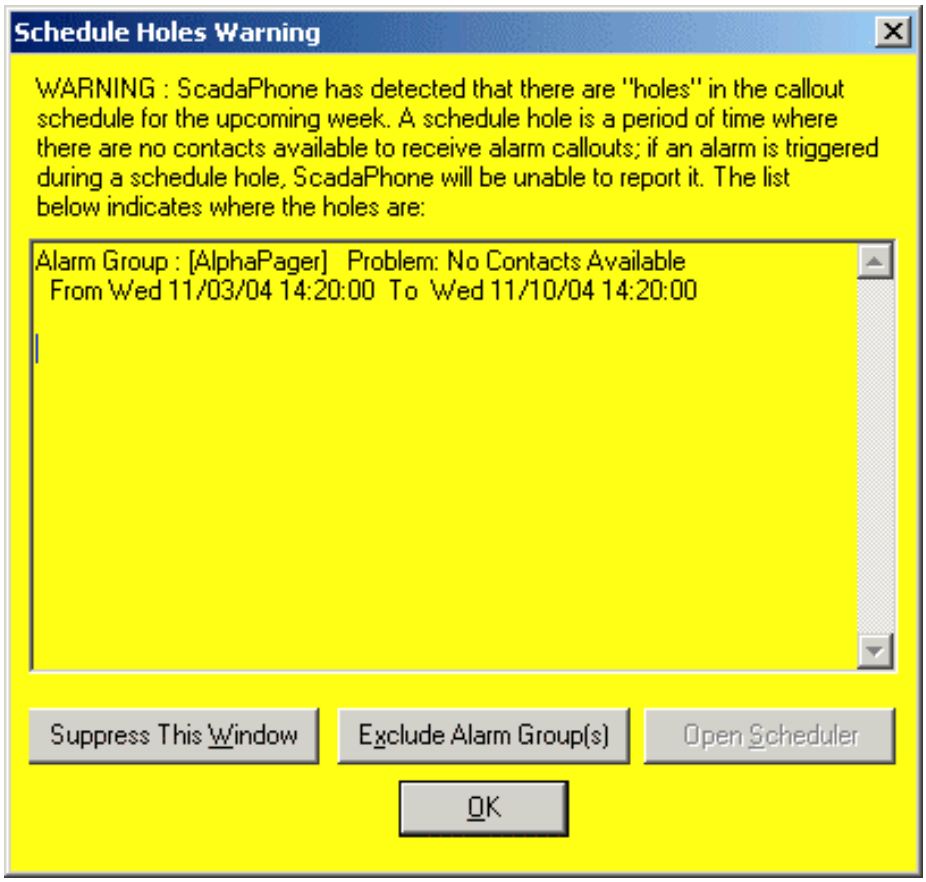
The Schedule Override Bit

The regularly scheduled callout action can be superceeded by an override action if this discrete bit is True. The override bit and the override action is configured on the **Schedule Override Bit** form.



Schedule Holes

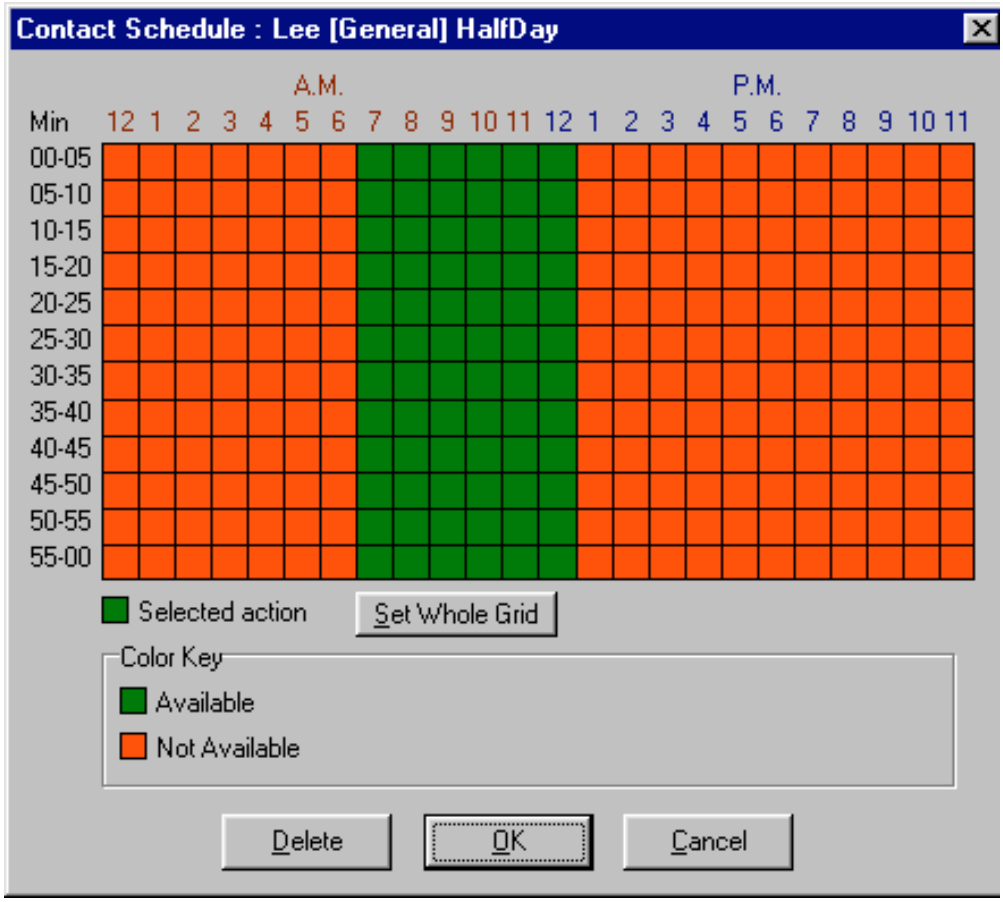
A schedule hole is a period of time where there are no contacts available to receive alarm callouts. If an alarm is triggered during a schedule hole, ScadaPhone will be unable to report it. To check for holes in the schedule click on the **Check For Schedule Holes** button. This will display the following window if there are holes. This check is performed automatically each time the scheduler window is closed.



To exclude alarm groups from this check click on the **Exclude Alarms Group(s)** Button.

Using the Contact Schedule Grid

The Contact Schedule Grid window is opened from the **Contact Availability Scheduler** window whenever a new schedule is created or an existing schedule is edited:



The contact schedule grid filled out for a half-day schedule

The Contact Schedule Grid consists of 288 (24 X 12) cells that represent a 24-hour day divided into 5-minute time slices. The grid columns represent hours, the grid rows represent 5-minute intervals. Each cell in the grid can be set to one of two states, Available or Not Available.

To set cell states, click the desired color swatch in the **Color Key** box. The selected color swatch will be displayed in the **Selected action** color swatch. Click on the **Set Whole Grid** button to set the entire 24 hour period to the **Selected action** color. Click a column heading to set an entire hour to the **Selected action** color. Click on an individual cell or click and drag to set individual cells to the **Selected action** color.

To save the schedule, click on the **OK** button. To exit a schedule without saving, click on the **Cancel** button. To remove a previously saved schedule, click on the **Delete** button. ScadaPhone will return to the **Contact Availability Scheduler** window.

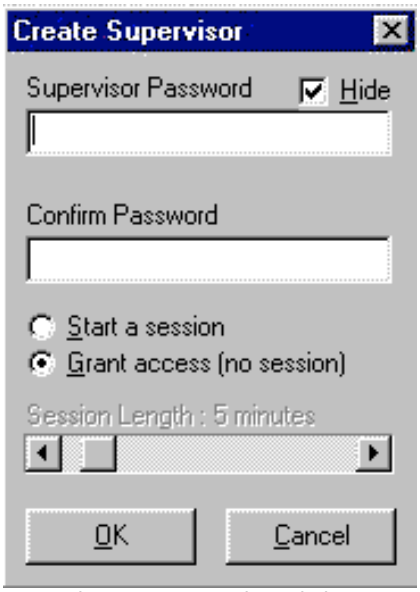
Creating a User's List

Access to ScadaPhone is controlled by passwords. A user list must be created in order to specify passwords and access levels for authorized users of the system. To access the user list, click the **Users** tab on ScadaPhone's main Window. If no users have been defined, the message "No users defined" will be displayed. Before a user list can be created, a supervisor must be defined; supervisor access is required to create the user list. After the supervisor is defined, user accounts may be created. The user list must be created in Development Mode.

Note: In the Sample project included with ScadaPhone, the default Supervisor password is 2000.

Creating a Supervisor

To create a supervisor, on the **Users** tab of the main window, click the **New** button. The **Create Supervisor** window will appear:

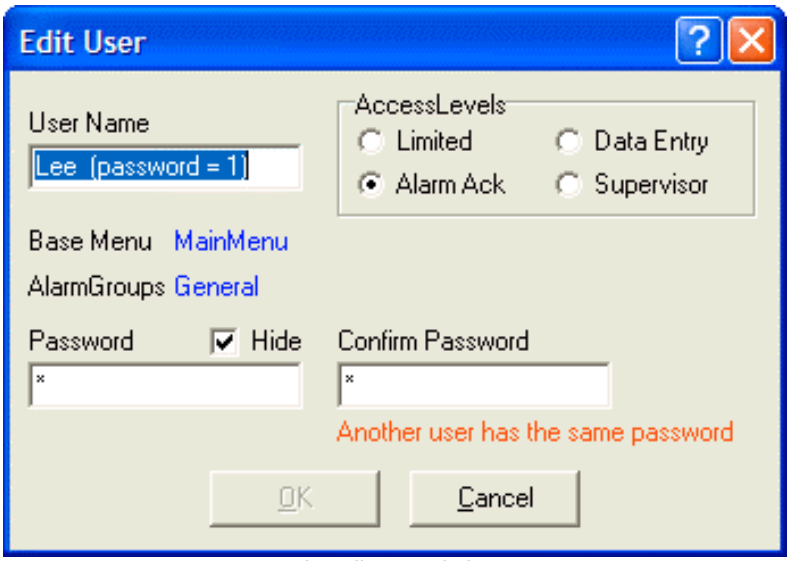


The Create Supervisor window

Select a supervisor password, enter it twice (as indicated). Be sure to remember this password! After the passwords are entered, either select **Start a session** or **Grant access (no session)**. Starting a session allows the supervisor to perform all password-controlled functions for up to 60 minutes without having to repeatedly enter the password. Set the session length using the scroll bar. The Grant access option only allows performance of a single operation. Click **OK** when finished.

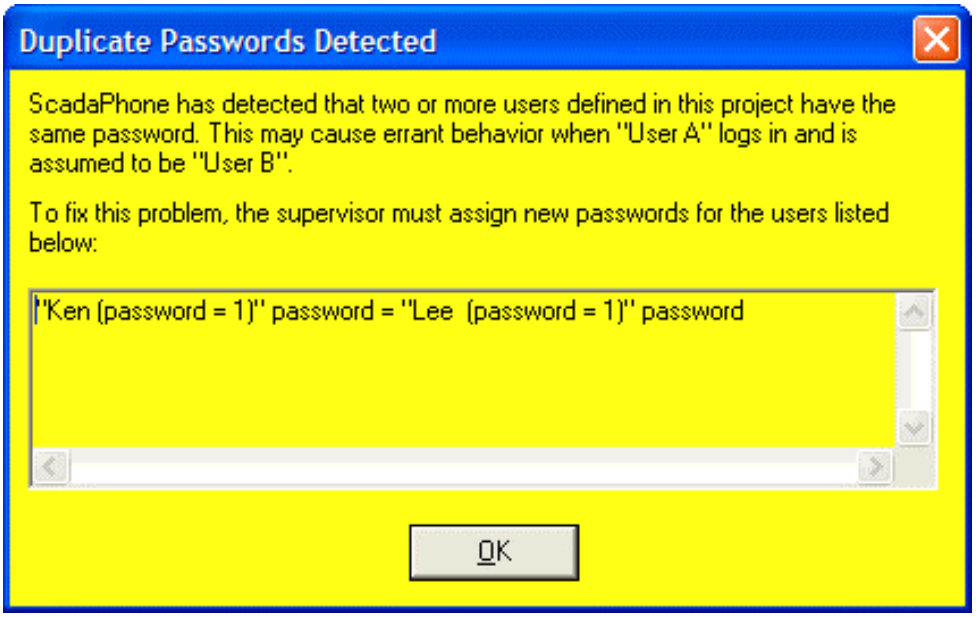
Creating User Accounts

After the supervisor login is defined, any number of additional users with varying access levels may be defined. To define users, click the **New** button from the **Users** tab of the main window. The **Edit User** window will be displayed:



The Edit User window

This window allows entry of the user's name, alarm group, access level, and password. All passwords must be unique a non-unique password is entered a red warning label is displayed as shown above, the 'OK' button is grayed out and the following warning dialog is displayed. The format is "UserName1" password = "UserName2" password. A check for duplicate passwords is also done when switching to 'RUN' mode.



Type the new user's name in the **User Name** text entry box.

Each user may be assigned a base menu to be played when he/she logs in. The default menu is MainMenu. To assign a different base menu click on the blue text to the right of 'Base Menu'. This option is used to assign different menu trees to different users.

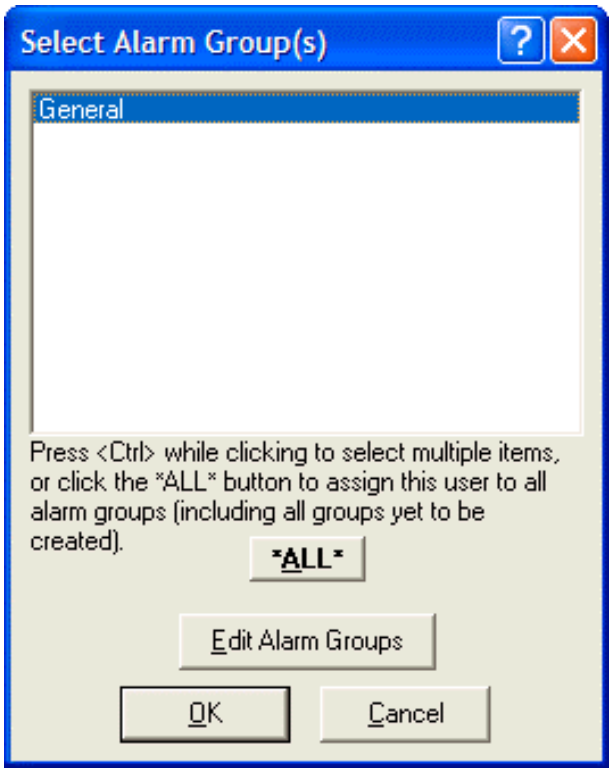
The new user must be assigned to one of the four Access Levels:

Ÿ ***Limited:*** This allows the user to listen to alarms and menus, but does not allow the user to

acknowledge alarms or change setpoints (analog or discrete values).

- ***Alarm Ack:*** This allows the user to listen to alarms and menus, acknowledge alarms, but does not allow the user to change setpoints (analog or discrete values).
- ***Data Entry:*** This allows the user to listen to alarms and menus, acknowledge alarms, and change setpoints (analog or discrete values).
- ***Supervisor:*** Can do all of the above as well as make other changes within ScadaPhone, such as adding or deleting users and changing user passwords.

Alarm grouping allows alarms and callouts to be assigned to different groups, so that different people will be called for different alarms. By default, the new user is assigned to the General group. To select a different group, or to create a new group, click on the blue link. The following dialog will appear. For more information about creating alarm groups, *see*: Alarm Groups.. This will display the following dialog box.



Click on the '*ALL* button to assign the user to receive alarms from all current and future groups.

Enter the user's unique password in the **Password** and **Confirm Password** boxes. Clicking the **Hide** check box will alternate the characters displayed in the password boxes: If **Hide** is checked, asterisks are displayed; if **Hide** is not checked, the password is visible. Also note that when **Hide** is not checked, a label showing the password converted into telephone digits is displayed (e.g. if the password is Rocky, the telephone digits will be 76259).

When the user definition is completed, click the **OK** button. The new user will be added to the list displayed on the **Users** tab in the main window.

Editing or Deleting a User

A user may be edited by highlighting the user name on the **Users** tab of the main window and clicking the **Edit** button. The **Edit User** window will be displayed. Enter the changes and click the **OK** button.

To remove a user, highlight the user name on the **Users** tab of the main window and click the **Delete** button.

Creating Alarm Tags and Messages

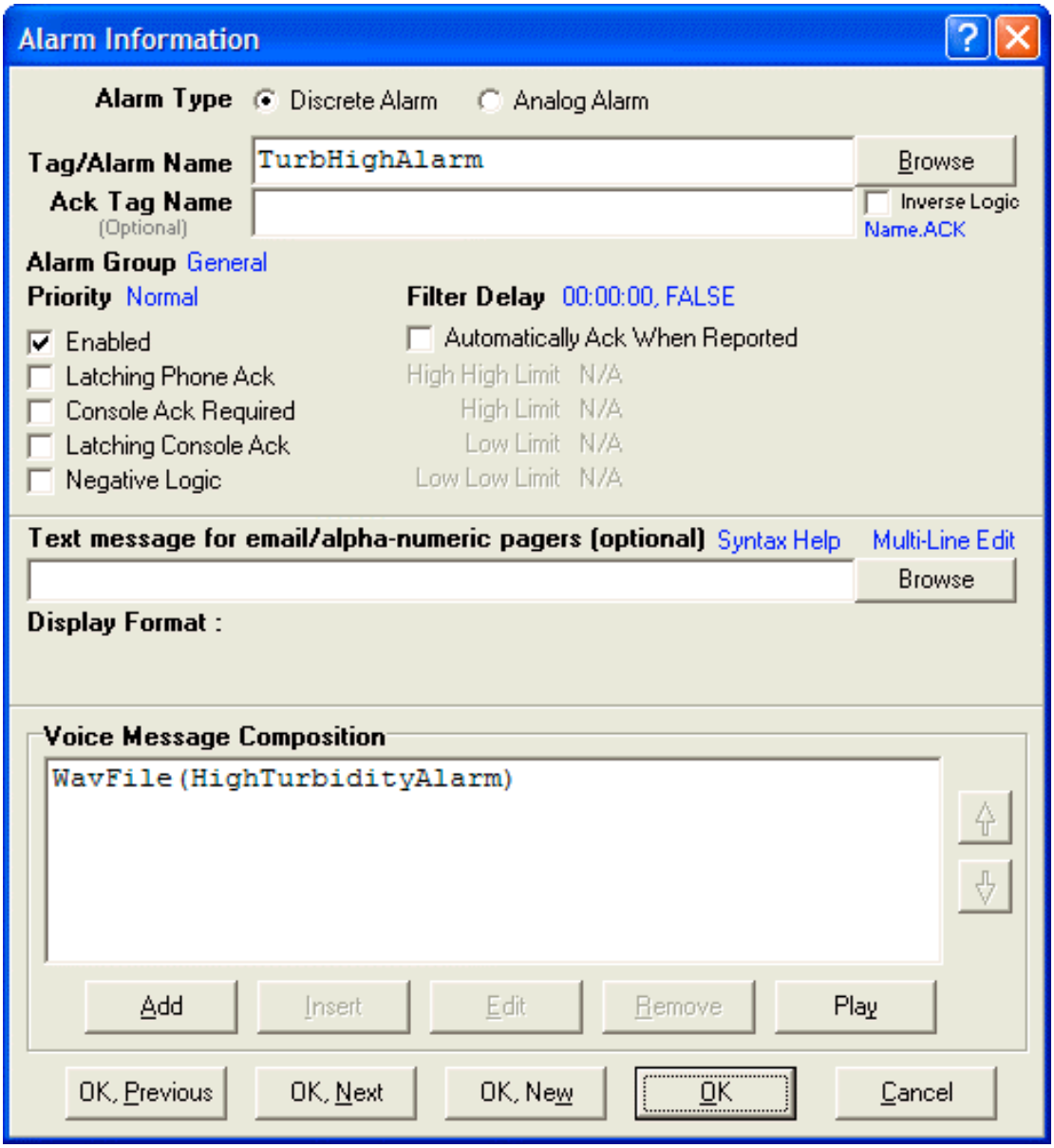
Alarm tags and messages are created in Development Mode.

ScadaPhone allows an unlimited number of alarm messages to be defined. The alarm messages report the status of analog or discrete alarm tags in a SCADA system. These alarms may be grouped so that different groups of people can be notified for different alarms. Alarm messages are added through the **Alarm Information** window.

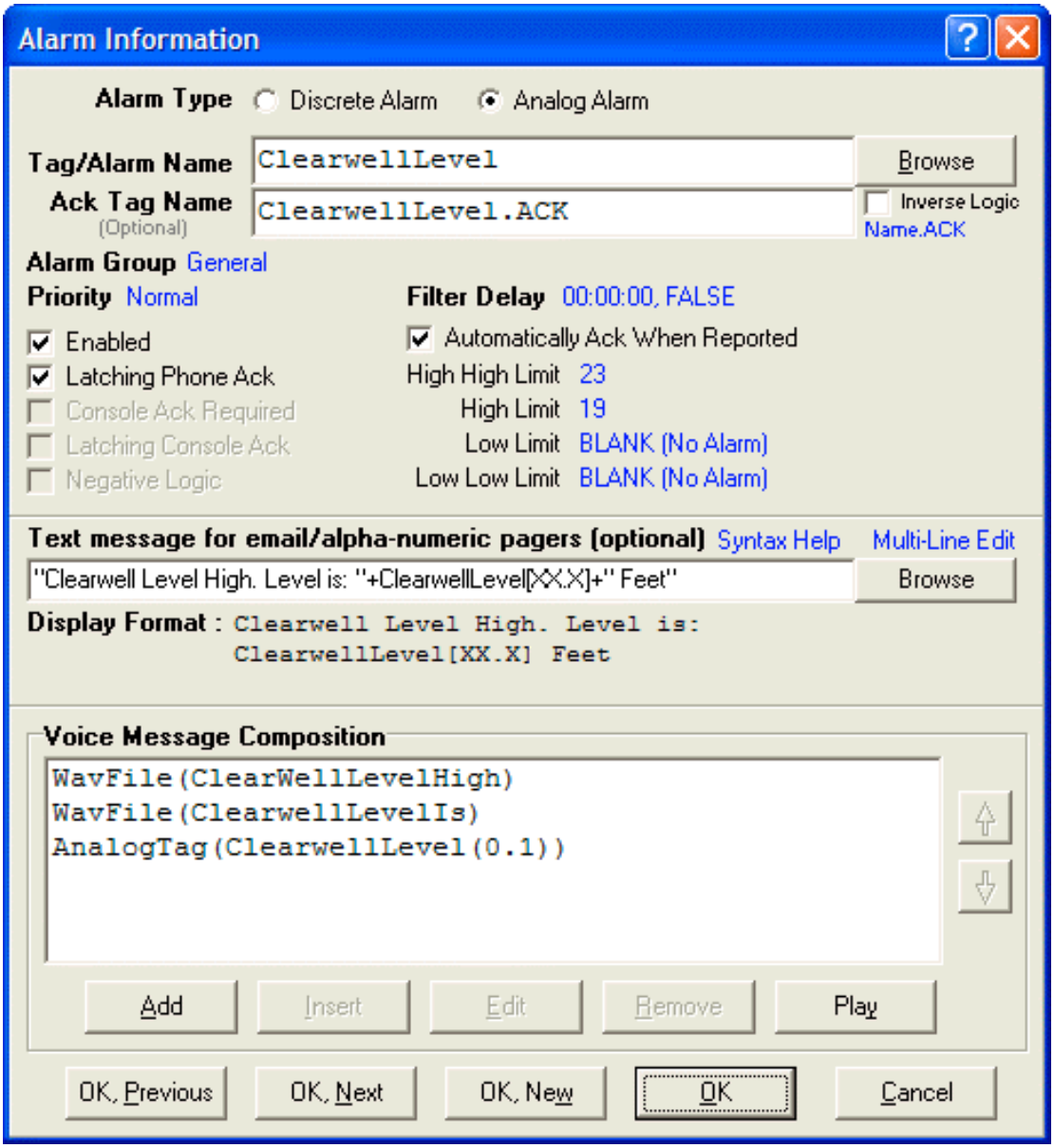
Note: If ScadaPhone is being configured for use with CitectSCADA software, alarm tags may be imported directly form the CitectSCADA software. Please see the topic, Citect Interface.

To open the **Alarm Information** window, click on the **Alarms** tab on the main window, then click on the **New** button or selecting an alarm and clicking the **Edit** button near the bottom of this window. The **Alarm Information** window will appear.

Note: The **Alarm Information** window can also be opened by selecting **Window | Alarms** from the main screen's top menu and clicking on the **New** button. Existing alarms may be edited by selecting the alarm and clicking on the **Edit** button.



The Alarm Information Window for discrete alarm tags



The Alarm Information Window for analog alarm tags

Alarm Type

Alarms may be generated from discrete or analog tags. Start by selecting the type of tag which will be used for this alarm, this will change the alarm information window to allow entry of the appropriate information.

Tag/Alarm Name

The name of the SCADA tag to be polled (and which will trigger this alarm) must be entered into the top **Tag/Alarm Name** box. To enter a tag name do one of the following:

Type the tag name of the SCADA system alarm data point into the **Tag Name** text entry box *exactly* as it appears in the SCADA system database (except as noted below).

OR

Click the **Browse** button to see a list of discrete tag names defined on the alarm tab but not used in

an alarm. (*Related topic:* Entering Tag Names)

OR - If Citect has been selected in ScadaLink Setup:

Click the blur **Browse Citect Alarms** text to select and import alarms from the Citect SCADA software. **Note:** The blue text shows up only if Citect has been selected in ScadaLink Setup.

Note: The tag name may also be a computed tag, in which case it does not need to match a tag name in the SCADA system. *See:* Computed Tags. In addition, ScadaPhone reserves the "$" symbol for predefined system tags. If the SCADA tag name happens to begin with "$", prefix the alarm tag name with two dollar signs: "$$".

Ack Tag Name

ScadaPhone can report alarm acknowledgment back to the SCADA system via the **Ack Tag Name** box in the **Alarm Information** window. To utilize this feature, an acknowledgment tag name needs to be entered into this dialog box. If a tag name is entered into this box, ScadaPhone will set this tag in the SCADA system to a logical "1" when the alarm has been acknowledged in ScadaPhone. ScadaPhone will set this value back to "0" after it has recognized the acknowledgement. Some SCADA systems provide the ability to acknowledge an alarm via an extension on the alarm tag name. A common extension is *.ack*. For example, if the alarm tag name is TurbHighAlarm, then to have ScadaPhone send an acknowledgement for this alarm to the SCADA system, the Ack Tag Name will be *TurbHighAlarm.ack*. A quick way to enter this common acknowledgment tag name is by clicking on the blue link following the **Ack Tag Name** box. For iFix alarms the suffex appended is .A_NALM. If the SCADA system uses a different acknowledgement scheme, type in the entire acknowledgment tag name. If the SCADA system requires that the acknowledgment tag be set to a logical "0" when the alarm has been acknowledged in ScadaPhone then check the **Inverse Logic** checkbox.

Alarm Group

Under the **Tag/Alarm name** box in the **Alarm Information** window is the **Alarm Group** settings. The blue link shows which alarm group the alarm will be placed in. By default, a new alarm is assigned to the General group. To select a different group, or to create a new group, click on this link. **Note**: Alarm grouping allows alarms and callouts to be assigned to different groups, so that different people will be called for different alarms. For more information about creating alarm groups, *see*: Alarm Groups

Check the enabled option to have ScadaPhone report the alarm. If the enabled option is unchecked, ScadaPhone will NOT report the alarm. Select additional appropriate options for the alarm group by clicking on one or more of the corresponding check boxes:

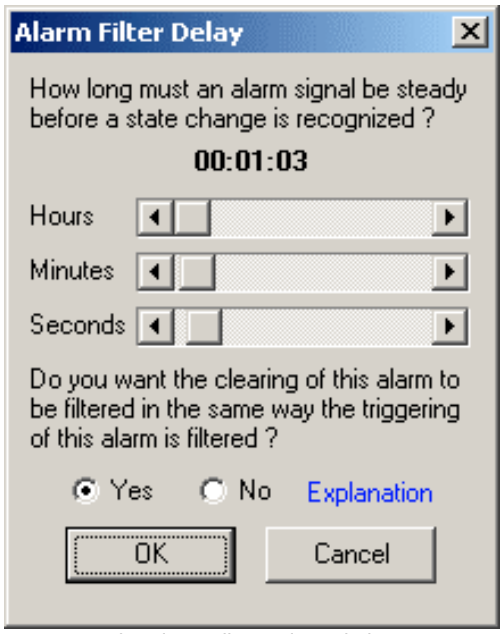
- **Enabled** - Enable/disable this alarm from being reported.
- **Latching Phone Ack** - Requires that the alarm be acknowledged from the phone even if the alarm is no longer active. This will also ensure that the contact will know which alarm caused the callout even if it is no longer active.
- **Console Ack Required** - Requires that the alarm be acknowledged from the PC console.
- **Latching Console Ack** - Requires that the alarm be acknowledged from the PC console even if it is no longer active.
- **Negative Logic** - If this option is selected, the alarm is reported when the discrete tag turns FALSE instead of the normal mode which reports the alarm when the discrete tag turns TRUE.

Priority

Alarms can be assigned one of 6 priorities: Very Low, Low, Normal, High, Very High, and Broadcast. An alarm's priority dictates how it will be positioned within alarm announcements (i.e. Broadcast alarms will be reported before Very High priority alarms, Very High priority alarms will be reported before High priority alarms, etc...). The highest priority alarms, Broadcast, will be announced to every available contact in rapid succession (ScadaPhone will not wait for contacts to acknowledge Broadcast alarms before calling the next contact). After all of the contacts have been called to report a Broadcast alarm, ScadaPhone will wait for phone acknowledgements.

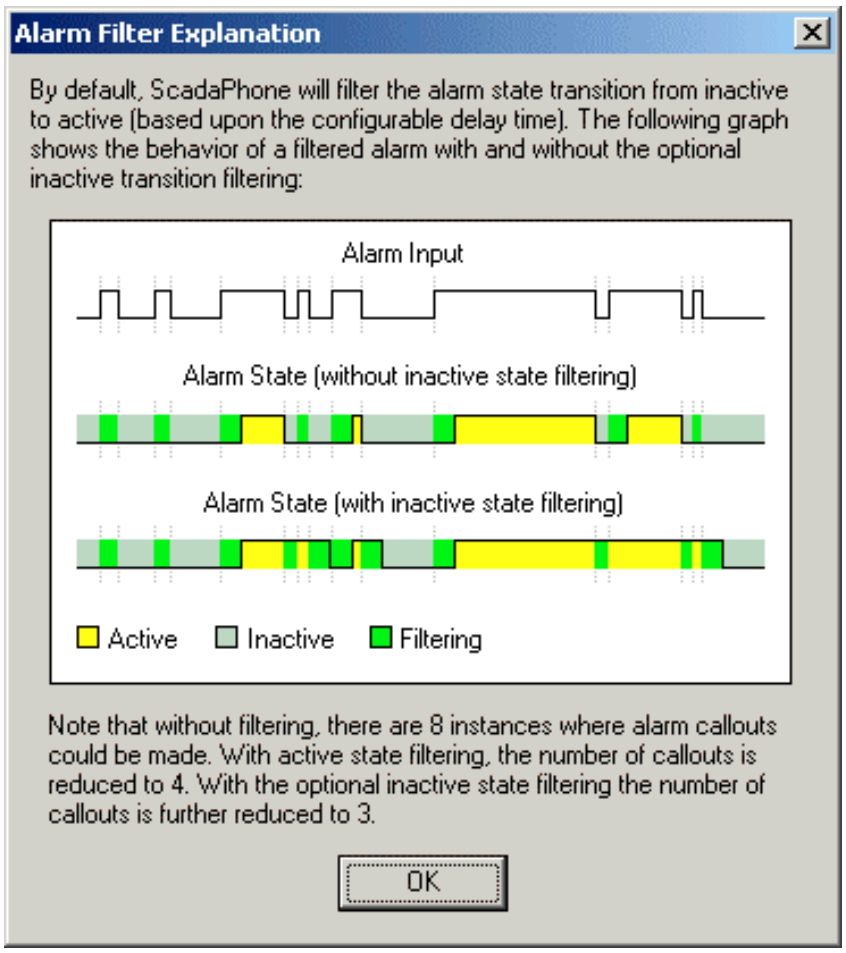
Signal Filtering

Under the **Tag/Alarm name** box in the **Alarm Information** window is the **Filter delay** display . The amount of time shown in this display determines how long the alarm condition must be active before the alarm is reported. The boolean field following the filter delay time display indicates if this delay will be applied when the alarm clears. To change the setting Click on the blue display text. This will bring up the Alarm Filter Delay dialog where the delay value may be adjusted.



The Alarm Filter Delay Window

Note that this same delay may be applied when the alarm clears by selecting the **Yes** radio button. For a detailed explanation click on the blue text to the right of the radio buttons. This will bring up the following dialog.

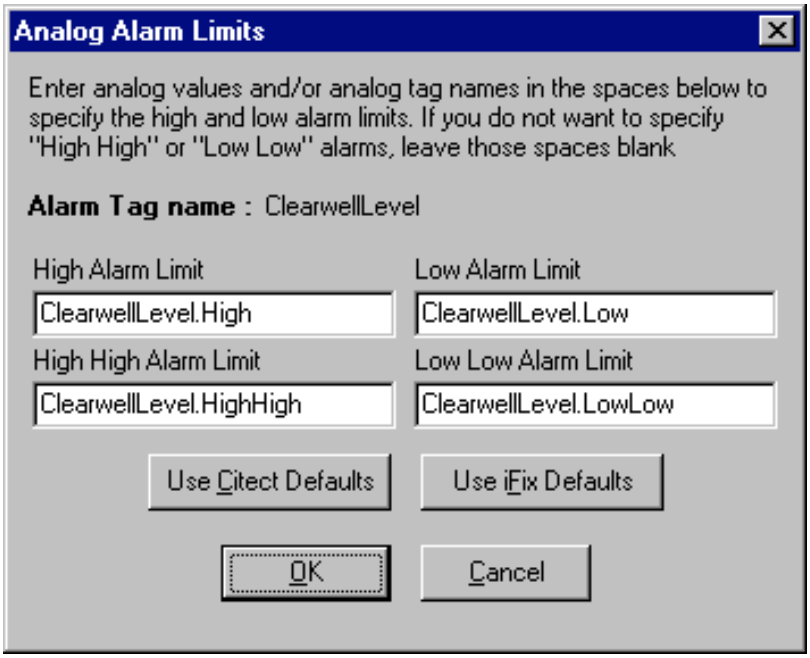


Automatically Ack When Reported

To have alarms to be "automatically acknowledged" upon being successfully reported check this box. If this box is not checked the alarm will not be considered acknowledged until it us physically acknowledged by a user, either at the console of via the phone.

Setting High and Low Alarm Limits

If the Analog Alarm type is selected you may set the High, High High, Low, and Low Low alarm limits. This is done by clicking on the blue text to the right of any of the limits. This will bring up the Analog Alarm Limits dialog. Numeric values or analog tag names may be entered for each limit. Clicking on either of the 'Defaults' buttons will antomaticaly enter the correct alarm limit tags for the indicated SCADA system.



The Analog Alarm Limits window

Text Message for e-mail or Alpha-numeric Pagers

In the center of the **Alarm Information** window is a text box for entering alpha-numeric text messages. ScadaPhone can send a text message with an embedded tag value to an alpha-numeric pager or to an e-mail address. (To send a text message, select either the **Alpha-numeric Pager using TAP protocol** option or the **Email** option in the Alarm Contact Window. E-mail settings must be set from the main menu under **Options | Email Settings**.)

The text message is composed of static text (text that does not change), the tag name, and formatting information. The static text must be enclosed in double-quotes and separated from the tag name with plus signs. As the text message is composed, the display format will be shown under the text box. If a multi-line text message is desired, click on the blue **Multi-Line Edit** text to the right of the text message title. This will bring up the Multi-Line Text Message Editor window which will allow the insertion of carriage returns in the message.

Note: If there are any errors in the configuration of a text message, the message will be output as is.

Analog Tag Text Message Example:

To display the message "Tank 1 high level" followed by the current value (to one decimal place) for the **Tank1Level** analog tag, enter this text message :

"Tank 1 high level : "+Tank1Level(X.X)+" feet"

If Tank1Level has a value of 26.223, the above text message will produce this output :

```
Tank 1 high level : 26.2 feet
```

Notice that with the format X.X, the tag value is rounded to one decimal place. A format of X.X will produce the following output given the following values for TankLevel1:

TankLevel1	X.X
0.05234	0.1

9.86111	9.9
99.95000	100.0

The fact that only one X is specified to the left of the decimal point does not affect the output. ScadaPhone will add more digits as needed. (Similarly, the formatting may be entered as XX.X, or even XXX.X. The number of X's to the left of the decimal place has no effect on output.)

Discrete Tag Text Message Example:

To display the text message "Tank 1 high level, transfer pump" followed by the value of a discrete tag named **XferPump1A** as RUNNING (if the tag value is true) or as OFF (if the tag value is false), enter this text message :

"Tank 1 high level, transfer pump : "+XferPump1A(RUNNING/OFF)

If the tag value is true, the above text message will produce this output :

```
Tank 1 high level, transfer pump : RUNNING
```

The general format is tagname(TrueString/FalseString). If the given tag value is true, the text message will display the string specified for the TrueString and if the given tag value is false the text message will display the string specified for the FalseString.

String Text Message Example:

To display the text message "Current status" followed by the value of the first ten characters of a string tag named **StatusStr**, enter this text message:

"Current status: "+StatusStr(10)

If StatusStr has a value of "BACKWASH FILTER #2", the above text message will produce this output:

```
Current status : BACKWASH F
```

The number in parenthesis following StatusStr is the maximum number of characters of the string tag's value that will display. If there is no limit for the length of the tag value, specify a length of (-1).

Voice Message Composition

At the bottom of the **Alarm Information** window is a text box for creating voice messages. A message must be created for ScadaPhone to use when an alarm is triggered. Most alarm messages are simple and straightforward, such as "Sulfuric acid tank is overflowing" or "Reactor core is approaching meltdown temperature." A single sound (WAV) file message segment can handle messages such as these. However, ScadaPhone's alarm and menu messages allow one or more message segments to be appended together, so that live tag values can be incorporated into the message.

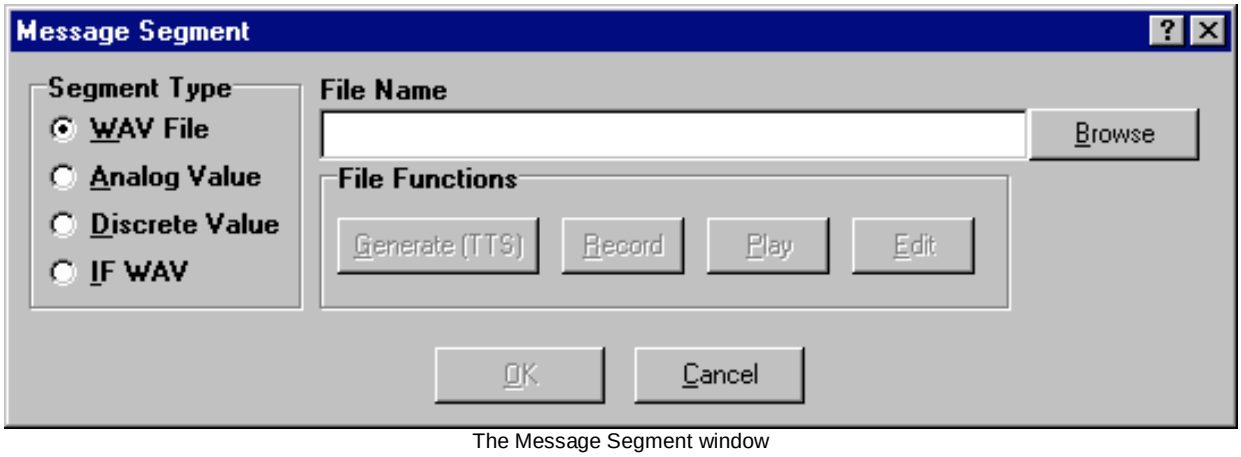
Creating Message Segments

There are four types of message segments:

1. WAV File: Any recorded message.
2. Analog Value: Enunciates the current value of an analog tag from the SCADA system.
3. Discrete Value: Enunciates the current value of a discrete tag from the SCADA system.
4. If WAV: Allows the inclusion of a wav file in the message segment based on a boolean expression.

To create message segments, click the **Add** button in the **Voice Message Composition** box of the

Alarm Information window. This will open the **Message Segment** window.



The Message Segment window

There three options in the **Segment Type** panel, covered in detail below:

- WAV file
- Analog Value
- Discrete Value
- IF WAV

When the WAV file option is selected, the **Message Segment** box will include a **File Functions** box.
When the Analog Value is selected, the **File Functions** box is replaced by the **Analog Formats** box.
When the Discrete Value is selected, the **File Functions** box is replaced by the **Discrete Formats** box.

Defining WAV Message Segments

To use an existing WAV file message segment:

- In the **Message Segment** window, click the **Browse** button. This will open the **Select WAV file** window.
- Click on the name of the WAV file to be added
- Click on the **OK** button.
- Click the **OK** button in the **Message Segment** window to return to the **Alarm Information** window. The name of the message segment will be entered into the **Voice Message Composition** list.

To create a new WAV File message segment:

- In the **Message Segment** window, click the **WAV File** option.
- Enter the name of the WAV file in the **File Name** edit box. **Note**: Do not enter a file extension. The extension '.WAV' will be added by ScadaPhone.
- Click **Record**. ScadaPhone will display a pop-up box with a **Stop** button. When the pop-up box indicates recording is in progress, speak the desired message segment into the microphone.
- Click **Stop** to end the recording. This will close the recording box.
- Click the **Play** button to listen to the message segment just recorded. If necessary, re-record a WAV segment by clicking the **Record** button again. If the WAV file already exists, a pop-up box will ask confirmation of the file overwrite.

Note: The recording and playback of sound (WAV) files may be done either through the voice modem or a PC sound card. ***See:*** Setting the COM Port from the main window

WAV files may also be edited for content or unwanted noise at the beginning and/or end of the

recording may be trimmed. To edit a WAV file, select the file click the **Edit** button in the **Message Segment** window. This will open the **Edit Wav File** window. *Details*: Editing WAV Files

When the message segment is complete, click **OK** from the **Message Segment** window to return to the **Alarm Information** window. The name of the message segment will be entered into the **Voice Message Composition** list.

Defining Analog Value Message Segments

An analog value may be added to an alarm message. To add an Analog value message segment to the **Alarm Information** window's **Voice Message Composition** box, click **Add**. The **Message Segment** window will open. Click the **Analog Value** option. The **File Functions** box is replaced by **Analog Formats**.

Enter the name of the analog tag to be enunciated. Use the **Browse** button to see a list of analog tag names defined on the main window's **Analog** tab.

Adjust the slider to select the number of digits to the right of the decimal point to be enunciated.

Click **OK** to return to the **Alarm Information** window. The name of the analog tag will be entered into the **Voice Message Composition** list.

Defining Discrete Value Message Segments

A discrete value may be added to an alarm message. To add an Discrete Value message segment to the **Alarm Information** window's **Voice Message Composition** box, click **Add**. The **Message Segment** window will open. Click the **Discrete Value** option. The **File Functions** box is replaced by **Discrete Formats**.

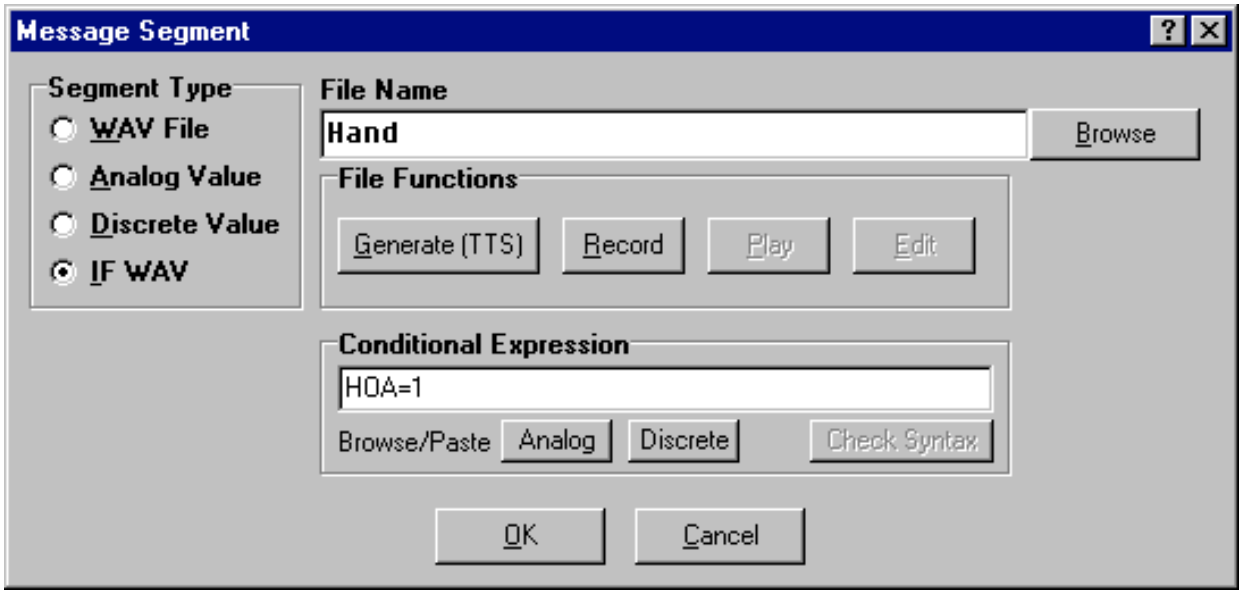
Enter the name of the discrete tag to be enunciated. Use the **Browse** button to see a list of discrete tag names defined on the main window's **Discrete** tab.

Click the appropriate option button in the **Discrete Formats** box to select the how the discrete value will be enunciated.

Click **OK** to return to the **Alarm Information** window. The name of the discrete tag will be entered into the **Voice Message Composition** list.

Defining Conditional WAV Message Segments

An existing WAV file may be conditionally added to an alarm message. To add a conditional WAV file segment to the **Alarm Information** window's **Voice Message Composition** box, click **Add**. The **Message Segment** window will open.



The Message Segment window with and IF WAV condition

Click the **If WAV** option. Select the name of the WAV file segment to be conditionally added by clicking on the **Browse** button next to the **File Name** text box. Enter the logical conditional expression in the **Conditional Expression** text box. The text will be shown in red until a valid logical expression is entered. Analog and discrete tags may be selected by clicking on the **Analog** or **Discrete** buttons.

The selected WAV file segment will be added to the voice message only when the conditional expression is **True**.

For example, this option may be used in situations such as enunciating the position of an HOA switch in either Hand, Off, or Auto. In this example, the message segment begins by stating "The HOA switch is in". This is followed by the word "Hand" when the value of the tag named HOA=1, by the word "Off" when HOA=2, or by the word "Auto" when HOA=3.This requires three **IF WAV** segments. The "Hand" **IF WAV** segment is shown above.

Managing Message Segments

To insert a new segment between existing segments in the **Alarm Information** window's **Voice Message Composition** box, click on the message segment just below where the new segment needs to be. Click on the **Insert** button. Define and record segments in the Message Segment window just as when the **Add** button is clicked.

To change an existing message segment, highlight it and click the **Edit** button.

To delete a segment, highlight it and click the **Remove** button.

Click the **Play** button to hear the alarm message.

To change the order of message segments, use the up and down arrow buttons to move them to the correct position.

Saving the Alarm Message

To save an alarm message in the **Alarm Information** window and return to ScadaPhone's main window, click the **OK** button.

To save the current alarm message and open the previously defined message on the main window's Alarms tab into the **Alarm Information** window, click the **OK,Previous** button.

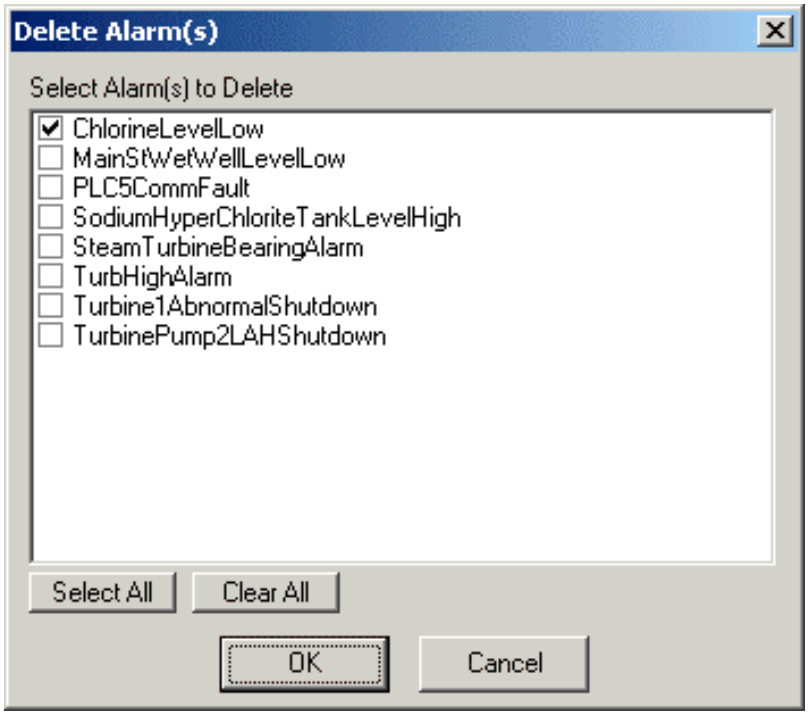
To save the current alarm message and open the next defined message on the main window's Alarms tab into the **Alarm Information** window, click the **OK,Next** button.

To save the current alarm message and start a new one, click the **OK, New** button.

To exit the current alarm message without saving any changes, click the **Cancel** button.

Deleting an Alarm

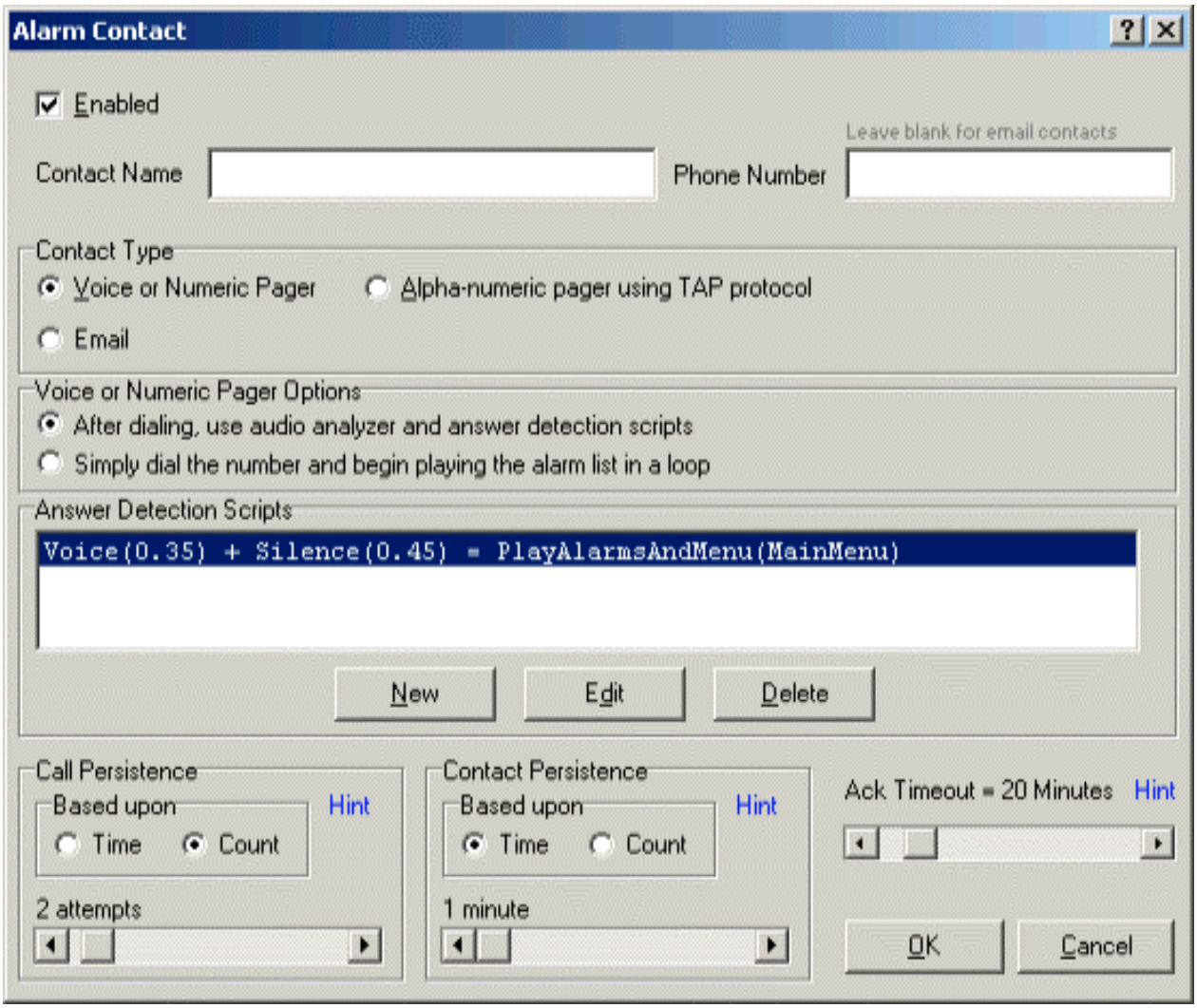
To remove an alarm, highlight the alarm name on the **Alarms** tab of the main window and click the **Delete** button. This will bring up the following dialog.



One or more alarms may be selected for deletion. When an alarm is deleted all the tags that are associated with the deleted alarm(s) and not used elsewhere are also deleted.

Creating and Editing Answer Detection Scripts

Answer detection scripts dictate how ScadaPhone handles outgoing (alarm reporting) telephone calls. Answer detection scripts are set up in the **Alarm Contact** window. Open the **Alarm Contact** window by selecting the **Contacts** tab on ScadaPhone's main window and then either click the **New** button or select a contact name and click the **Edit** button. The **Answer Detection Scripts** box is in the center of this window:



The Alarm Contact window

Each contact can have an unlimited number of answer detection scripts; however, most contacts will only have one script. The conceptual format of a script is as follows:

```
Event + Event = Action
```

Each event corresponds to audio signal states detected by ScadaPhone's Audio Analyzer. The Audio Analyzer recognizes *Voice*, *Silence*, and *Tone* events. *Tone* events are used to recognize the beeps in pager service, voice mail system or answering machine prompts. The Voice Check event is intended to be used to check to see if a hardware dialer is alive and well. If the hardware dialer fails to respond to the call with a voice, ScadaPhone will set the bit specified in the 'SetBit' action TRUE, if not it will be set

FALSE. This bit can then be used to trigger an alarm. Note: If the hardware modem is calling out when ScadaPhone attempts to check it a false alarm may be generated.

Action corresponds to one of five possible actions that ScadaPhone can take if the specified events are detected:

1. Play the alarms
2. Play a menu
3. Play the alarms and a menu
4. Send pager tones
5. SetBit

For example, in the **Alarm Contact** window shown above, the default answer detection script reads:
`Voice(0.1) + Silence(0.5) = PlayAlarmsAndMenu(MainMenu)`

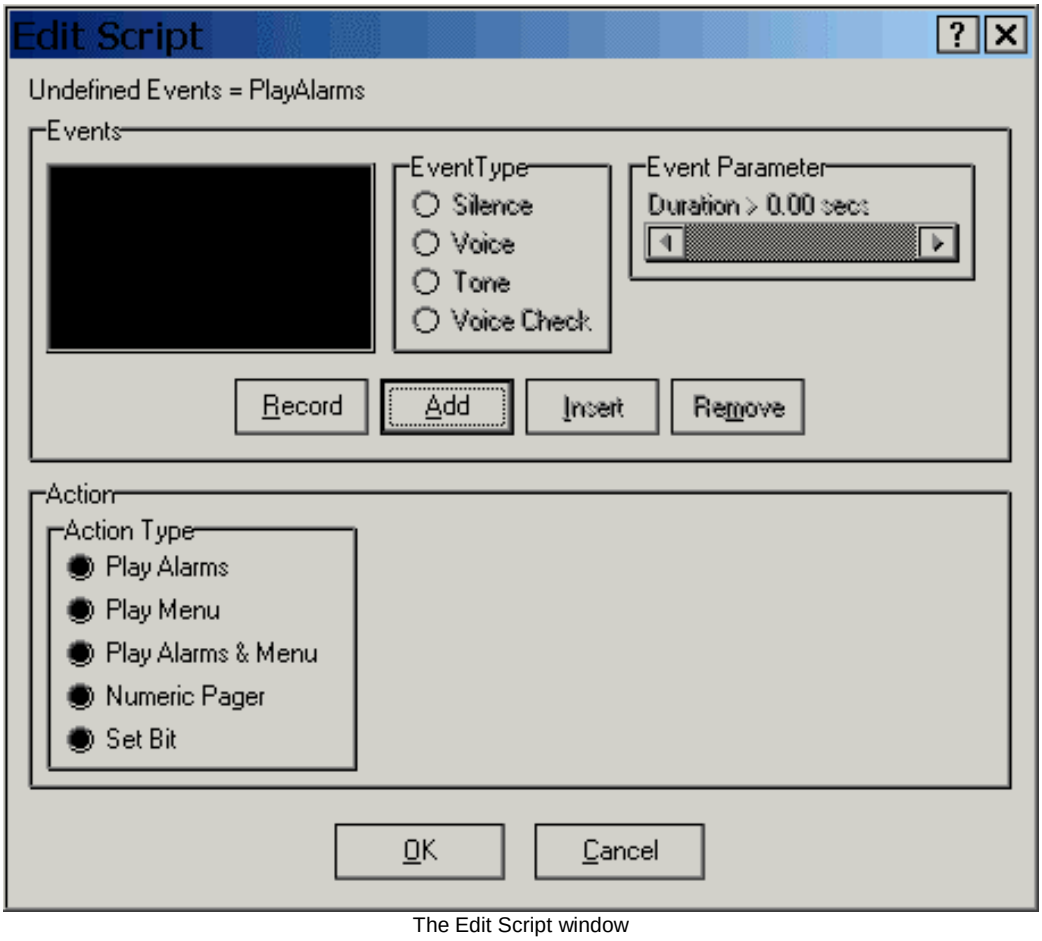
This script causes ScadaPhone to do the following when alarms are reported to this contact:

- Instruct the modem to dial the number in the **Phone Number** box
- Turn on the Audio Analyzer and "listen" to the audio signal coming from the remote telephone.
- Disregard signal states that do not correspond to the script events (i.e. the ringing signal from the telephone company, the silence between the rings, etc.).
- If a voice is detected for at least 0.1 seconds, and it is followed by 0.5 seconds of silence, announce the list of active alarms and then present the contact with the MainMenu.

Note that in the in above example, both the Voice event parameter (0.1), and the Silence event parameter (0.5) specify duration in seconds. ScadaPhone also recognizes tone events. The parameter for tone events specifies a sound frequency (in Hz.) rather than duration in seconds.

Creating a New Answer Detection Script

To create a new answer detection script, click the **New** button under the **Answer Detection Scripts** box in the **Alarm Contact** window. This will open the **Edit Script** window:



The Edit Script window

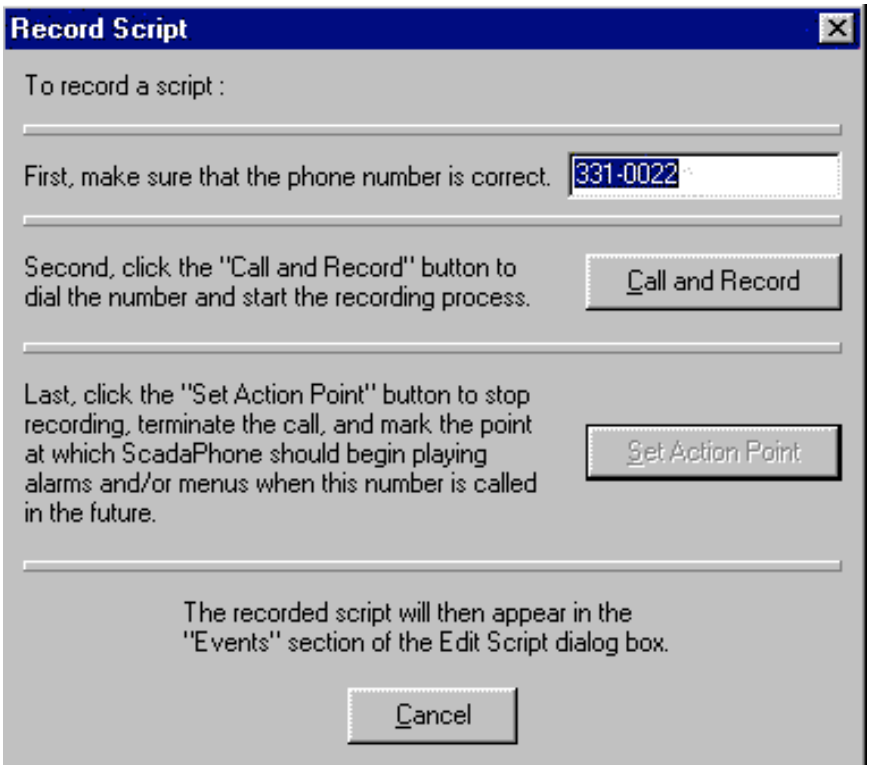
The Events Box

The **Events** box in the **Edit Script** window shows the list of events that will occur when the script is triggered. A new event is added by clicking either the **Record** or the **Add** button. The **Record** button allows the actual recording of an event. The **Add** button allows manual entry of an event.

Note: Once events are listed in the **Events** box, ScadaPhone enables the **Insert** and **Remove** buttons. A new event may be inserted before an existing event by selecting that event and clicking **Insert**. This will open the **New Script Event** window. An existing script may be removed by selecting that script and clicking **Remove**.

Recording a Script

The easiest way to create a new script is to record it. A script should be recorded if the exact setup of the events that occur when ScadaPhone dials a contact is uncertain, or if the contact prompts callers with one or more beeps and the frequency of the beeps is uncertain. To record a script, click the **Record** button in the **Edit Script** window. This will open the **Record Script** window:



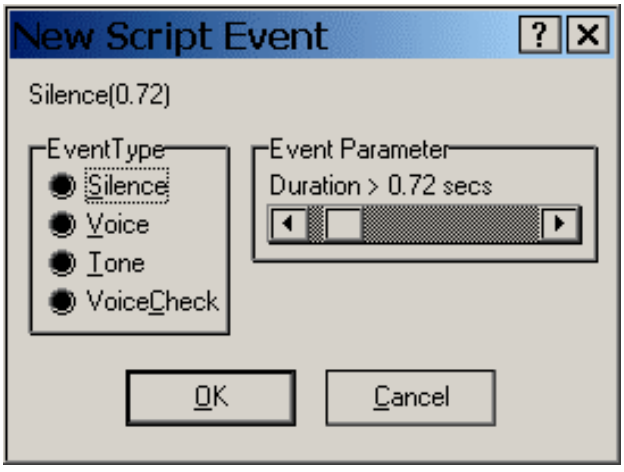
Recording a script requires three steps:

1. Verify that the phone number in the top box is correct or make any needed changes
2. Click the **Call and Record** button
3. Click the **Set Action Point** button to stop recording.

After step 3, ScadaPhone will return to the **Edit Script** window. The recorded script will be entered into the **Events** box.

Adding a Script

When the exact sequence that occur when ScadaPhone dials a contact is known, script events may be added manually. Click the **Add** button to open the **New Script Event** window:



Select the Event Type. For Silence, Voice and VoiceCheck events, use the scroll bar to set the length of

the event in seconds. For Tone events, use the scroll bar to set the frequency in hertz. Click the **OK** button to return to the **New Script Event** window. The event will be entered into the **Events** box.

Note: Once events are listed in the **Events** box, ScadaPhone enables the **Insert** and **Remove** buttons. A new event may be inserted before an existing event by selecting that event and clicking **Insert**. This will open the **New Script Event** window. An existing script may be removed by selecting that script and clicking **Remove**.

Script Actions

The **Actions** box of the **Edit Script** window is used to determine what action ScadaPhone will take when an answer detection script's events are detected. ScadaPhone can be configured to perform one of four actions:

- **Play Alarms**: If this action is selected, ScadaPhone will announce "The following alarms require acknowledgment", followed by the alarm messages. After the alarm messages, ScadaPhone will state: "*This call will be reissued if acknowledgments are not received within __ minutes.*" The number of minutes is set in the **Ack Time-out** setting on the **Alarm Contact** window. The call will be terminated after these messages have been played. This action is best suited for making calls to voice mail services or answering machines.
- **Play Menu**: This action will cause a specified menu to be played when an answer is detected. This action should only be selected if the contact is an attended telephone (that is, a person will answer the phone, not a message service). Otherwise, the menu will be played repeatedly until it times-out after one minute of no response. Unlike the **Play Alarms** action, ScadaPhone will not wait a set amount of minutes for alarm acknowledgments before placing another call. Attended contacts are expected to provide acknowledgment before hanging up.
- **Play Alarms & Menu**: This action combines the previous two actions. A typical call utilizing this action would be as follows: "The following alarms require acknowledgment. Tank number one high level. Main menu. To enter your security code, press zero..." As in the **Play Menu** action, this action should only be selected for use with an attended contact because the menu will be waiting for someone to select an option.
- **Numeric Pager**: This action is used when the contact is a numeric pager service. This action will cause ScadaPhone to send a specific phone number (using telephone touch-tones) after ScadaPhone hears the pager service's prompt (usually three beeps). The pager string number is set from the main window under **Options | Pager String**. The pager string value is stored in a system variable named PagerStr. This number is typically the access number of the SCADA system or the ScadaPhone system.
- **SetBit:** This action is used in conjunction with the 'VoiceCheck' event to verify the status of hardware dialers.. It is set TRUE if the hardware dialer responds to the call with a voice, otherwise it is set to FALSE. The specified discrete can then be used to trigger a ScadaPhone alarm. SetBit could conceivably be used for other purposes as well.

Select the appropriate option in the **Action Type** box of the **Edit Script** window. Select the appropriate button. If **Play Menu** or **Play Alarms & Menu** is selected, ScadaPhone will open an **Action Parameter** box in the **Edit Script** window. The **Action Parameter** is where the name of the menu to be played should be specified. Use the **Browse** button to select the correct menu.

Once the answer detection script is set up, click the **OK** button at the bottom of the **Edit Script** window. ScadaPhone will return to the **Alarm Contact** window. The new and/or edited scripts are displayed in the **Answer Detection Scripts** box.

Multiple Scripts

A contact may have more than one script. This allows ScadaPhone to act appropriately if an answering machine is encountered at a telephone number that is normally attended (where a person answers the phone). That is, ScadaPhone will not play a menu repeatedly for one minute to an answering machine that can't respond to the menu's prompts. For example, the following two scripts would take one action

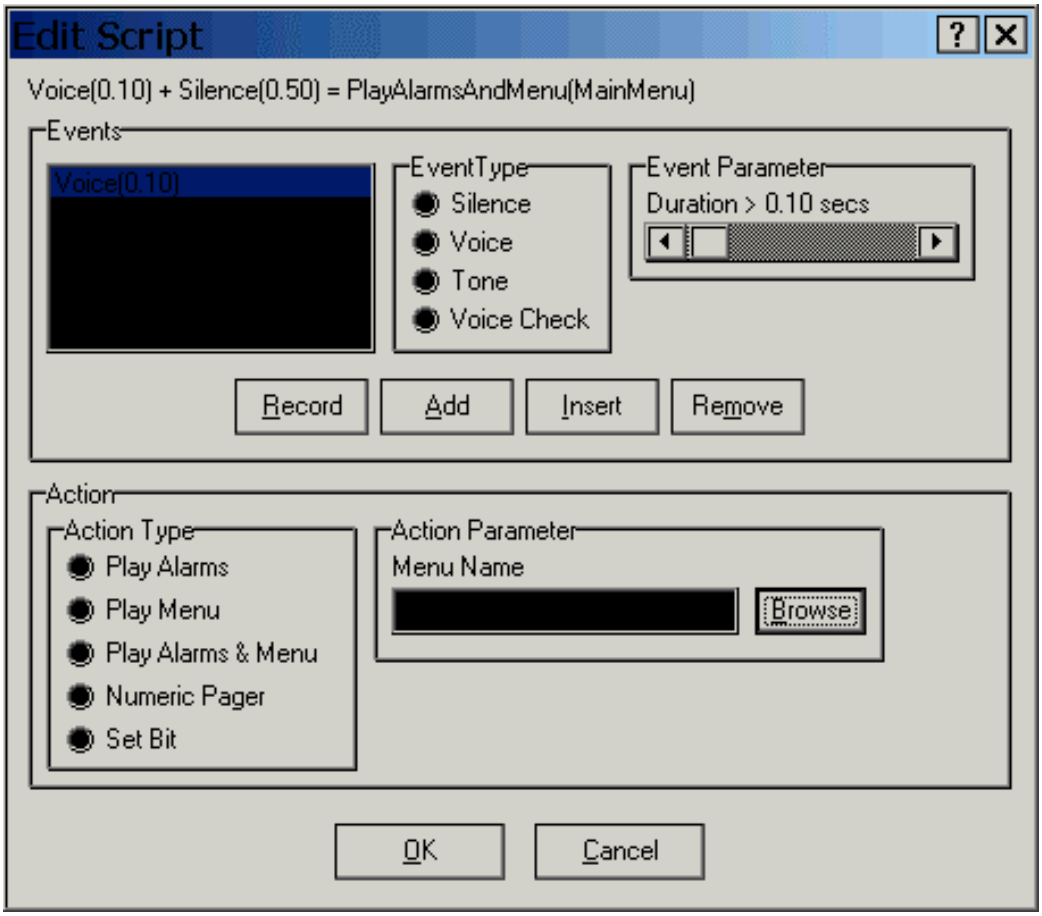
when the telephone is answered by a live person and another when the telephone is answered by an answering machine:

```
Voice (0.10) + Silence (1.00) = PlayAlarmsAndMenu (MainMenu)
Tone (607) + Silence (0.10) = PlayAlarms
```

Note that the first script requires a voice followed by one full second of silence. The length of the silence event is important in order to prevent the first script from being triggered during brief pauses in the answering machine's prompt. For example, an answering machine might play the following message: "Hi this is Ken. <Pause> I'm not home right now. <Pause> Leave your name and number and I'll call you back. <Beep>." If the pauses in the prompt message are less than one second, then ScadaPhone won't start the PlayAlarmsAndMenu action erroneously. If Ken is home, he will have to remain silent for one second after saying "Hello" before the first script will be triggered into action. **Note**: For this to work properly, not only must the contact know to pause at least one second after answering the phone, the answering machine message must not contain pauses longer than one second in length or the first script will be triggered. To examine an answering machine message and check the length of any pauses, first record the message using the **Record** button on the **Edit Script** window. After recording the script, examine the length of any pauses within the script file with the Audio Analyzer.
Details:
The Audio Analyzer
Answering Machine Contact Example

Editing Answer Detection Scripts

An existing script in the **Alarm Contact** window may be edited by selecting that script and clicking the **Edit** button. This will open the **Edit Script** window. For example, the default script Voice(0.1) + Silence(0.5) may be edited by selecting that script and clicking **Edit**. The following window will be displayed:



The Edit Script window when editing the PlayAlarmsAndMenu script

At the top of the **Edit Script** window is a label that shows the current value of the script being edited (in the format: Event + Event = Action). The Events box shows the list of events and provides the means for editing the event list.

Note that the **Event Type** and **Event Parameter** settings correspond to the selected event in the **Events** list box on the left. Clicking on a different event in the list will show the **Event Type** and **Event Parameter** settings for that event. The settings for an event may be changed by selecting that event and then changing the **Event Type** and/or adjusting the **Event Parameter** scroll bar. The script label at the top of the window will reflect any changes.

Events can be added or removed via the **Record**, **Add**, **Insert**, and **Remove** buttons. ***See:*** The Events Box under the heading Creating a New Answer Detection Script.

Related Topics:
Entering Alarm Contact Information

Examples

Pager Alarm Contact Example
Answering Machine Contact Example

Troubleshooting

If an answer detection script does not work properly, it may be analyzed with ScadaPhone's Audio

Analyzer and the settings refined. ***See***: The Audio Analyzer

Creating and Editing Phone Menus

About ScadaPhone Menus

When a person contacts ScadaPhone by phone, the caller is presented with an automated menu system. ScadaPhone comes with a default menu structure. However, the menu messages and choices presented to the person on the phone may be customized. There are two types of menus:

1. **User Defined Menus**: These are the customizable menus. The User Defined menus are accessed via the Menus tab in ScadaPhone's main window. **Note**: Do not prefix User Defined menu names with a "$". This is reserved for system menu names and system variables. A MainMenu is defined by default. The MainMenu is normally the first menu played when an incoming call is answered by ScadaPhone.
2. **System Menus**: These all start with a dollar sign, such as $AlarmMenu or $EnterAnalogMenu and may be viewed by clicking the Sys Menus tab. **Note**: If the Sys Menus tab is not visible on the main window menu, select **Options | Show System Tabs**. If the main window is too narrow to show all the tabs, additional tabs may be seen by clicking the right or left arrows at the right end of the tabs, or by widening the window. The voice files of the system menus may be edited, but do not change the Menu Item Actions or Menu Item Enable conditions as this could adversely affect system operation.

ScadaPhone's Default Menu Structure

When a new project is started, ScadaPhone creates a default menu structure with a main menu named MainMenu. MainMenu presents a system submenu named $EnterCodeMenu. When a caller enters a valid security code, the MainMenu presents the $AlarmMenu. The $AlarmMenu uses three system submenus, $AlarmAckMenu, $IndividualAlarmAckMenu, and $IndividualAlarmMenu.

Note: ScadaPhone's menu structure uses a number of system WAV files. These WAV files may be viewed on the main window's **Sys Wavs** tab. ScadaPhone's system works best if the content of these files is not changed. They may be re-recorded to change the voice to match other user-defined WAV files, but the message should stay the same. *See:* Edit WAV Files. If a needed WAV file is missing, ScadaPhone will create the default menu structure, but the missing WAV files will be displayed in red on the **Sys Wavs** tab.

The following describes what happens when a user calls into the default menu structure.

Note: On all ScadaPhone menus, the message will repeat until:
The caller hangs up
OR
the message times out after 60 seconds and ScadaPhone hangs up
OR
the caller presses the requested touch tone.

Main Menu Options

When a user first calls into ScadaPhone, only option 0 is enabled. ScadaPhone will announce the following:
"*Main menu. To enter your security code, press 0. To hang up, press #*"

After a caller enters their security code, only option 1 is enabled. ScadaPhone will announce the following:

"Main menu. To hear the alarm menu, press 1."

Main Menu Option 0 (Security Code Entry)

On the **Main Menu**, when 0 is pressed, ScadaPhone presents the **Enter Code Menu**.
ScadaPhone announces:
"*Enter code followed by # sign. To clear input and start again, press *. To abort input press * twice.*"
The message repeats until the caller enters a security code using the touch-tone keys. **Note**: A user's security code is the same as their password. *See:* Create a User's List

If an invalid security code is entered:
ScadaPhone announces:
"*Invalid code entered.*"
ScadaPhone then returns to the **Main Menu**.

If a valid security code is entered:
ScadaPhone announces:
"*[Caller's access level] enabled."*
ScadaPhone then returns to the **Main Menu.**

Main Menu Option 1 (Alarm Menu)

After the caller enters a valid security code, option 1 is enabled. When the caller presses 1 from the **Main Menu**, ScadaPhone presents the **Alarm Menu:**
"*Alarm menu. To hear all active alarms, press 1. To hear all alarms requiring acknowledgement, press 2. To hear alarms individually, press 3. To return to the previous menu, press *. To return to the main menu, press #.*"

Note: ScadaPhone will only present acknowledgeable alarms to callers with the proper access level.

Alarm Menu Option 1 (Active Alarms)

When the caller presses 1 from the **Alarm Menu**, ScadaPhone announces all alarms as follows:
"*There are [number] active alarms.*"

ScadaPhone then plays the alarm message for each alarm. (This message is defined in the Alarm Information window.) ScadaPhone then repeats the **Alarm Menu**.

Alarm Menu Option 2 (Alarm Acknowledgement Menu)

When the caller presses 2 from the **Alarm Menu**, ScadaPhone presents the **Alarm Ack Menu**. ScadaPhone announces all acknowledgeable alarms as follows:
"*There are [number] acknowledgeable alarms.*"

ScadaPhone then plays the message for each acknowledgeable alarm. (This message is defined in the Alarm Information window.) The alarm messages are followed by:
"*To acknowledge these alarms press 1. To repeat the alarm list press 2. To return to the previous menu, press *. To return to the main menu press #.*"

If there are no acknowledgeable alarms, ScadaPhone will not ask the caller to press 1 and returns to the alarm menu.

Alarm Ack Menu Option 1 (Acknowledge Alarms)

When the caller presses 1 from the **Alarm Ack Menu**, ScadaPhone recognizes all telephone acknowledgeable alarms as acknowledged and will no longer announce these alarms as needing telephone acknowledgment. Console acknowledgeable alarms will still be announced as needing console acknowledgment. (Console alarms must be

acknowledged by highlighting the alarm name on ScadaPhone's alarm tab and clicking the **Acknowledge** button.)The alarms will still be active and will be announced as active, until the value is reset. After the caller presses 1, ScadaPhone will return to the **Alarm Menu**.

Alarm Menu Option 3 (Individual Alarm Menu)

When the caller presses 3 from the **Alarm Menu**, ScadaPhone presents the **Individual Alarm Menu.** ScadaPhone announces individual alarms as follows:
"*There are [number] active alarms. There are [number] alarms requiring telephone acknowledgement. There are [number] alarms requiring console acknowledgement. To hear the next active alarm, press 1. To hear the next alarm requiring telephone acknowledgement, press 2. To hear the next alarm requiring console acknowledgement, press 3. To return to the previous menu, press *. To return to the main menu press #.*"

Individual Alarm Menu Option 1 (Next Active Alarm)

When the caller presses 1 from the **Individual Alarm Menu**, ScadaPhone presents the **Individual Alarm Ack Menu**. ScadaPhone plays the next active alarm message. (This message is defined in the Alarm Information window.) The alarm message is followed by:
"*To acknowledge this alarm press 1. To return to the previous menu, press *. To return to the main menu press #.*"

Individual Alarm Menu Option 2 (Next Alarm Requiring Telephone Acknowledgement)

When the caller presses 2 from the **Individual Alarm Menu**, ScadaPhone presents the **Individual Alarm Ack Menu**. ScadaPhone plays the next active telephone acknowledgeable alarm message. (This alarm message is defined in the Alarm Information window.) The alarm message is followed by:
"*To acknowledge this alarm press 1. To return to the previous menu, press *. To return to the main menu press #.*"

Individual Alarm Menu Option 3 (Next Alarm Requiring Console Acknowledgement)

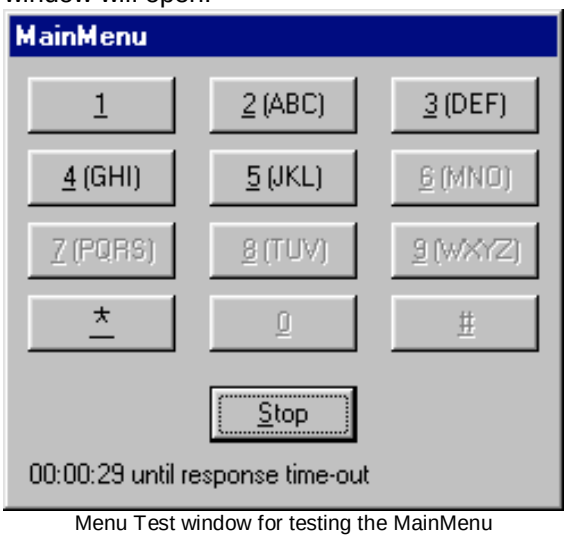
When the caller presses 3 from the **Individual Alarm Menu**, ScadaPhone presents the **Individual Alarm Ack Menu**. Scadaphone plays the next active console acknowledgeable alarm message. (This message is defined in the Alarm Information window.) If the alarm has not been acknowledged previously by telephone, the alarm message is followed by:
"*To acknowledge this alarm press 1. To return to the previous menu, press *. To return to the main menu press #.*"

Individual Alarm Ack Menu Option 1 (Acknowledge Alarms)

When the caller presses 1 from the **Individual Alarm Ack Menu**, if this alarm is a telephone acknowledgeable alarm, ScadaPhone recognizes this alarm as acknowledged and will no longer announce it as requiring telephone acknowledgement. If the alarm is a console acknowledgeable alarm, it will still be announced as needing console acknowledgment. (Console alarms must be acknowledged by highlighting the alarm name on ScadaPhone's alarm tab and clicking the **Acknowledge** button.) The alarm will still be active and will be announced as active, until the value is reset. After the caller presses 1, ScadaPhone announces *"Alarm acknowledged"* and returns to the **Individual Alarm Menu**.

Testing a Menu

To test a menu, click the **Menus** tab on ScadaPhone's main window. Select the menu name and click the **Test** button. The **Menu Test** window will open:



Menu Test window for testing the MainMenu

Simulate telephone key presses by clicking the buttons. Buttons that are either undefined or disabled are grayed out. Click the **Stop** button to terminate the menu test.

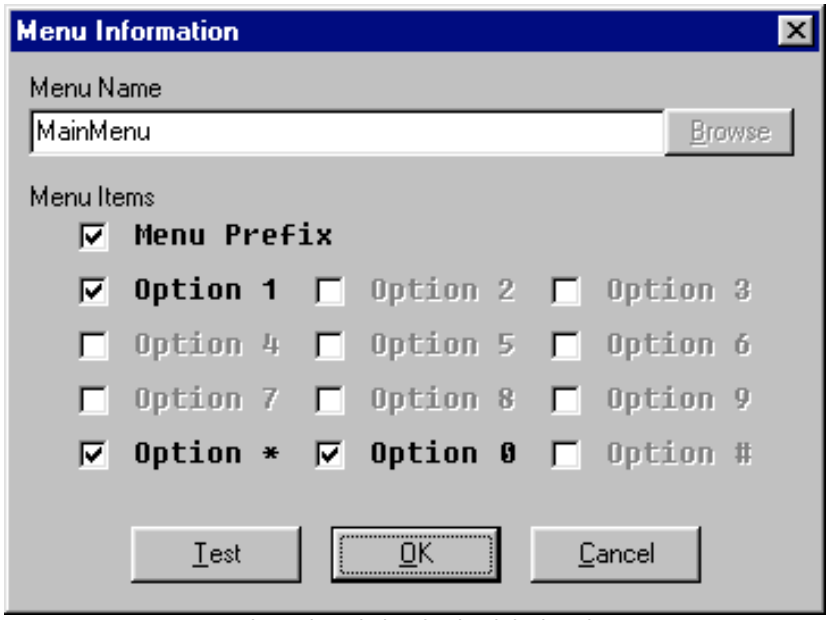
Customizing Menus

Menus are added and edited in Development Mode.

To begin to customize the menu system, click the **Menus** tab on ScadaPhone's main window. Menus may be added, edited, deleted, and played from the **Menus** tab. ScadaPhone defines a MainMenu by default. This default MainMenu is played when ScadaPhone answers an incoming call.

Adding and Editing Menus

To edit a menu, select a menu name on the main window's **Menus** tab and click the **Edit** button. To create a new menu, click the **New** button. Clicking either **Edit** or **New** will open the **Menu Information** window:

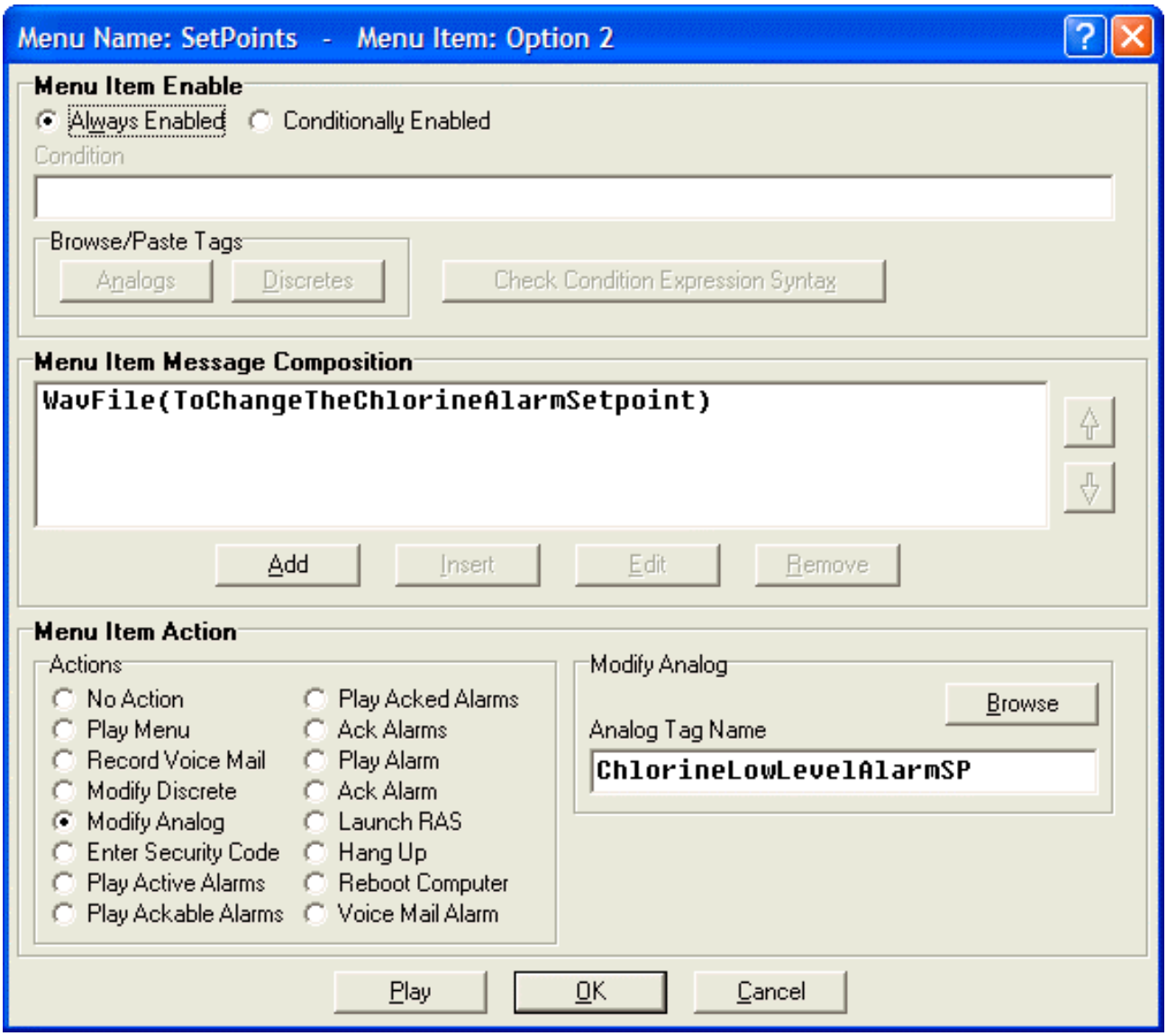


Menu Information window for the default MainMenu

The Menu Information window allows the customization of the voice messages that will be played and the actions that will be performed for each of the twelve available menu items. Each menu item corresponds to a button on a touch-tone phone. Additionally, ScadaPhone menus usually have a prefix message that is not associated with a telephone button, but is played as soon as the caller accesses the menu. The prefix message typically identifies the menu by vocalizing the menu's name. For example, in the default MainMenu, the prefix consists of a WAV file that says "*Main menu*."

The box at the top of the Menu Information window defines the menu's name. Type the name of the menu into this box or use the **Browse** button to see a list of previously defined menus.

The check boxes in the Menu Items section are used to indicate the menu items that are defined in the menu. Each check box corresponds to a key on the telephone touch pad. When the caller presses a key, the ScadaPhone performs the actions defined by that option's properties. To set a menu item's property, first click the check box to the left of the option. This enables that option. Next, move the mouse pointer over the menu item label. When the mouse pointer is moved over an enabled option, the mouse pointer will change from an arrow to a pointing hand. Click the option and the **Menu Item** window will open:



Menu Item window for the default MainMenu Prefix option

The **Menu Item** window is where properties of the menu item are defined. The Menu Item window is divided into three sections, covered in detail below:

- Menu Item Enable
- Menu Item Message Composition
- Menu Item Action

In the above example, the properties of the default MainMenu's prefix item are displayed. The **Menu Item Enable** is set to `Always Enabled`. This means that this menu item will be offered every time the menu is played. The **Menu Item Message Composition** contains only the system WAV file `$MainMenu`. The **Menu Item Action** is set to `No Action`. This is typical for a menu prefix item.

Menu Item Enable

Menu Item Enable pane

This section of the **Menu Item** window defines the condition which will enable the menu item and make it available to the caller. For the menu item to always be enabled, select the **Always Enabled** option. For the menu item to be enabled under certain conditions, select the **Conditionally Enabled** option. If the menu item is conditionally enabled, a logical (or Boolean) expression must be entered into the **Condition** box. Logical expressions may utilize any of the ScadaPhone system variables. *See:* ScadaPhone System Variables

For example, the default MainMenu has items defined for the 1 and * options, but they are not announced when a user first answers the telephone. This is because the 1 and * items are conditionally enabled. The default MainMenu has three conditionally enabled items:

- Menu item 1 condition: `$CurrentAccessLevel > 0`
- Menu item 0 condition: `$CurrentAccessLevel = 0`
- Menu item * condition: `$PrevMenuBit`

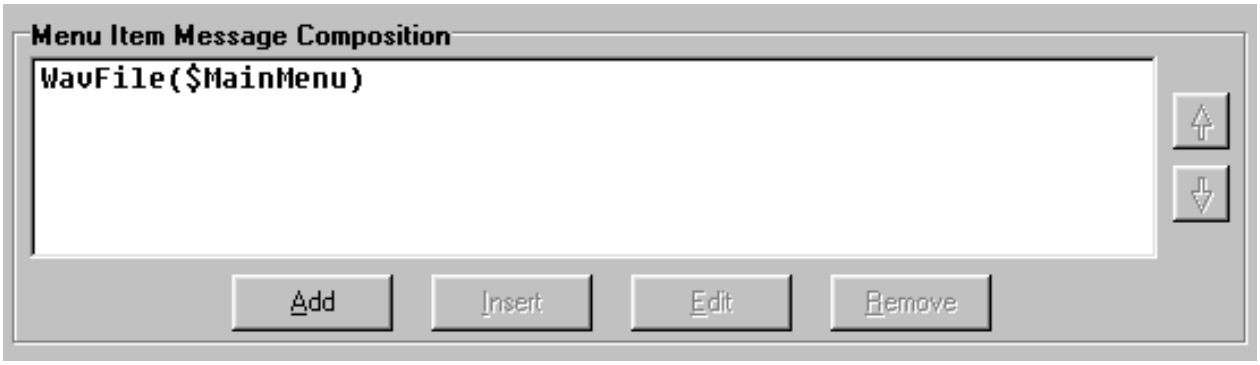
$CurrentAccessLevel is an analog system variable that holds a value representing the access level of the current user. This value is set when a caller enters their security code. *Details:* ScadaPhone System Variables. At the beginning of a telephone call, $CurrentAccessLevel is zero; therefore, menu item 1 is disabled and menu item 0 is enabled. If the caller presses 0 and enters a valid security code, $CurrentAccessLevel will be greater than zero; consequently, MainMenu item 1 will be enabled and item 0 will be disabled.

The $PrevMenuBit is a discrete system variable. This condition for menu item * is true if and only if MainMenu has been invoked from another menu. This prevents the MainMenu from prompting "*To return to the previous menu, press star*" if there is no previous menu to return to.

Use the **Analogs** button under the **Condition** box to browse and add analog tags defined on the main window's **Analogs** tab. Use the **Discretes** button to browse and add discrete tags defined on the main window's **Discretes** tab.

If the syntax for the condition expression is incorrect, the **Check Condition Expression Syntax** button will be highlighted in red. Click the button for suggested corrections.

Menu Item Message Composition



Menu Item Message Composition pane

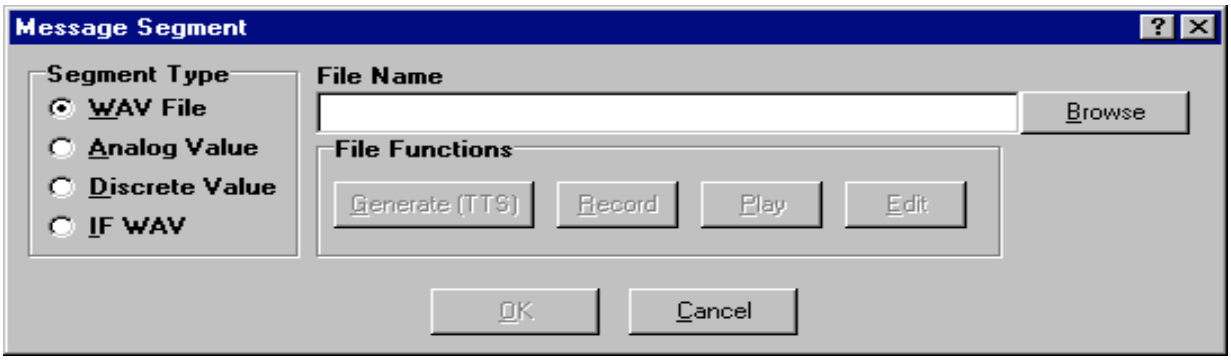
This section of the Menu Item window allows the construction of menu item prompts. The message created in this section is played only if the menu item is enabled. The words specifying which button to press, such as "*press one*" or "*press star*" are appended to menu item prompts automatically. For example, in the default MainMenu, menu item 0's prompt states: "*To enter your security code, press zero*." The menu item message consists of a single WAV file: **ToEnterYourSecurityCode.wav**. The "*press zero*" suffix is contained in a system WAV file (**$Press0.wav**) which is played automatically and therefore should not to be specified in the menu item message.

Creating Message Segments

There are three types of message segments:

1. WAV File: Any message you want to record.
2. Analog Value: Enunciates the current value of an analog tag from the SCADA system.
3. Discrete Value: Enunciates the current value of a discrete tag from the SCADA system.

To create message segments, click the **Add** button in the **Menu Item Message Composition** box of the Menu Item window. This will open the **Message Segment** window.



The Message Segment window

There are three options in the **Segment Type** panel, covered in detail below:

- WAV file
- Analog Value
- Discrete Value

When the WAV file option is selected, the **Message Segment** box will include a **File Functions** box. When the Analog Value is selected, the **File Functions** box is replaced by the **Analog Formats** box. When the Discrete Value is selected, the **File Functions** box is replaced by the **Discrete Formats** box.

Defining WAV Message Segments

To use an existing WAV file message segment:

- In the **Message Segment** window, click the **Browse** button. This will open the **Select WAV file**

window.

- Click on the name of the WAV file to be added
- Click on the **OK** button.
- Click the **OK** button in the **Message Segment** window to return to the **Menu Item** window. The name of the message segment will be entered into the **Menu Item Message Composition** list.

To create a new WAV File message segment:

- In the **Message Segment** window, click the **WAV File** option.
- Enter the name of the WAV file in the **File Name** edit box. **Note**: Do not enter a file extension. The extension '.WAV' will be added by ScadaPhone.
- Click **Record**. ScadaPhone will display a pop-up box with a **Stop** button. When the pop-up box indicates recording is in progress, speak the desired message segment into the microphone.
- Click **Stop** to end the recording. This will close the recording box.
- Click the **Play** button to listen to the message segment just recorded. If necessary, re-record a WAV segment by clicking the **Record** button again. If the WAV file already exists, a pop-up box will ask confirmation of the file overwrite.

Note: The recording and playback of sound (WAV) files may be done either through the voice modem or a PC sound card. ***See:*** Setting the COM Port from the main window

WAV files may also be edited for content or unwanted noise at the beginning or end of the recording may be trimmed. To edit a WAV file, select the file and click the **Edit** button in the **Message Segment** window. This will open the **Edit Wav File** window. *Details*: Editing WAV Files

When the message segment is complete, click **OK** from the **Message Segment** window to return to the **Menu Item** window. The name of the message segment will be entered into the **Menu Item Message Composition** list.

Defining Analog Value Message Segments

An Analog value may be added to a menu message. To add an analog message segment to the **Menu Item Message Composition** box in the **Menu Item** window, click **Add**. The **Message Segment** window will open. Click the **Analog Value** option. The **File Functions** box is replaced by **Analog Formats**.

Enter the name of the analog tag to be enunciated or use the **Browse** button to see a list of analog tag names defined on the main window's **Analog** tab.

Adjust the slider to select the number of digits to the right of the decimal point to be enunciated.

Click **OK** to return to the **Menu Item** window. The name of the analog tag will be entered into the **Menu Item Message Composition** list.

Defining Discrete Value Message Segments

A Discrete value may be added to a menu message. To add a discrete message segment to the **Menu Item Message Composition** box in the **Menu Item** window, click **Add**. The **Message Segment** window will open. Click the **Discrete Value** option. The **File Functions** box is replaced by **Discrete Formats**.

Enter the name of the discrete tag to be enunciated or use the **Browse** button to see a list of discrete tag names defined on the main window's **Discrete** tab.

Click the appropriate option button in the **Discrete Formats** box to select the how the discrete value will be enunciated.

Click **OK** to return to the **Menu Item** window. The name of the discrete tag will be entered into the **Menu Item Message Composition** list.

Managing Message Segments

To insert a new segment between existing segments in the **Menu Item** window's **Menu Item Message Composition** box, click on the message segment just below where the new segment needs to be. Click on the **Insert** button. Define and record segments in the **Message Segment** window just as when the **Add** button is clicked.

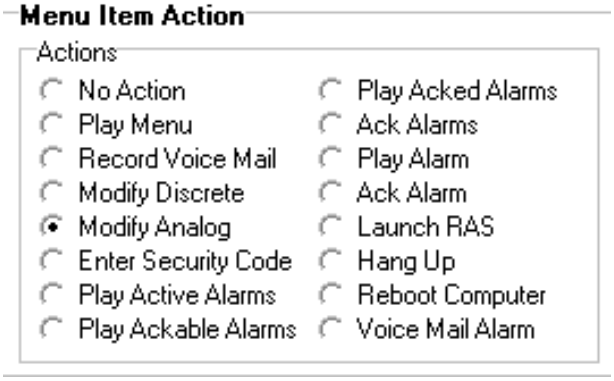
To change an existing message segment, highlight it and click the **Edit** button.

To delete a segment, highlight it and click the **Remove** button.

Click the **Play** button to hear the alarm message.

To change the order of message segments, select the name of the segment and click the up or down arrow buttons to move it to the correct position.

Menu Item Action



Menu Item Action pane

When a caller selects a menu item, ScadaPhone will perform a specific action. The **Menu Item Action** pane in the Menu Item window lists fourteen possible actions for a menu item to perform. However, it is recommended that user-defined menus use only the first five or the last three. These actions are as follows:

- **No Action**: Used in menu prefix items. In most menus, the prefix item states the menu name and performs no other action. However, the prefix item can perform actions, particularly if there are no other menu items defined in the menu.
- **Play Menu**: When the menu item is selected, this action transfers the caller to a different menu. When this action is specified a new pane is opened and the name of the menu to transfer to must be entered.
- **Record Voice Mail**: Prompts the caller to leave a message after the beep. When this action is specified, a new pane will pend and the name of a mail box into which the caller's message will be placed must be entered. ScadaPhone will create a new mail box with this name.
- **Modify Discrete**: Prompts the caller to change the state of a specified discrete tag. When this action is specified a new pane is opened and the name of the discrete tag must be entered.
- **Modify Analog**: Prompts the caller to change the value of a specified analog tag. When this action is specified a new pane is opened and the name of the analog tag must be entered.
- **Enter Security Code:** Enter user security code.
- **Play Active Alarms:** Play all active alarms..
- **Play Ackable Alarms:** Play all acknowledgeable alarms.
- **Play Acked Alarms:** Play previously acknowledged alarms that are still in alarm condition.
- **Ack Alarms:** Acknowledge all alarms.

- **Play Alarm:** Play a single alarm.
- **Ack Alarm:** Acknowledge a single alarm.
- **Launch RAS**: Launches the Remote Access Software, such as PCAnywhere. RAS must be configured from ScadaPhone's main screen menu under **Options | Remote Access Software**. *See:* Remote Access Software
- **Hang Up**: Causes ScadaPhone to hang up the phone immediately.
- **Reboot Computer**: Reboots the computer.
- **Voice Mail Alarm**: Allows the recording of voice mail wav files that are considered to be alarms. When a caller selects the menu item to which this action is assigned, an alarm is created in the alarm group which was specified when the Voice Mail Alarm action was defined. After these voice mail messages are recorded, a numbered alarm (in the format $VoiceMailAlarm1, $VoiceMailAlarm2,...) will be automatically added to the alarm list. These alarms are treated the same as any other alarm. The wav files can be seen under the Mailbox tab in 2 automatically generated mailboxes named "Active Voice Mail Alarms" and "Acknowledged Voice Mail Alarms". When the alarms are acknowledged, their wav files are moved from one directory to the other.

The remaining actions are utilized by ScadaPhone's default MainMenu structure. Incorporating them into user-defined menus could have an adverse effect on the MainMenu and therefore is not recommended. For information about these actions, ***see***: System Menu Action Items Reference

Menu Item Action Examples

Play Menu
Record Voice Mail
Modify Discrete
Modify Analog

Deleting a Menu

To remove a menu, highlight the menu name on the **Menus** tab of the main window and click the **Delete** button.

Changing ScadaPhone's Starting Menu

Access to ScadaPhone's menu system may be accessed from any touch tone phone. By default, the MainMenu is played when an incoming call is detected; however, a different menu may be created and played first. In many systems, an introductory menu to announce the name of the facility is desirable. For example, callers could be greeted with a message similar to the following: "*You have reached the city of Springfield's sewer treatment plant. Business hours are from 8 to 5, Monday through Friday. If you're calling to report a sewer emergency, please call 555-1234. To leave a non-emergency message for the plant operators, press one. To hear the main menu, press zero*".

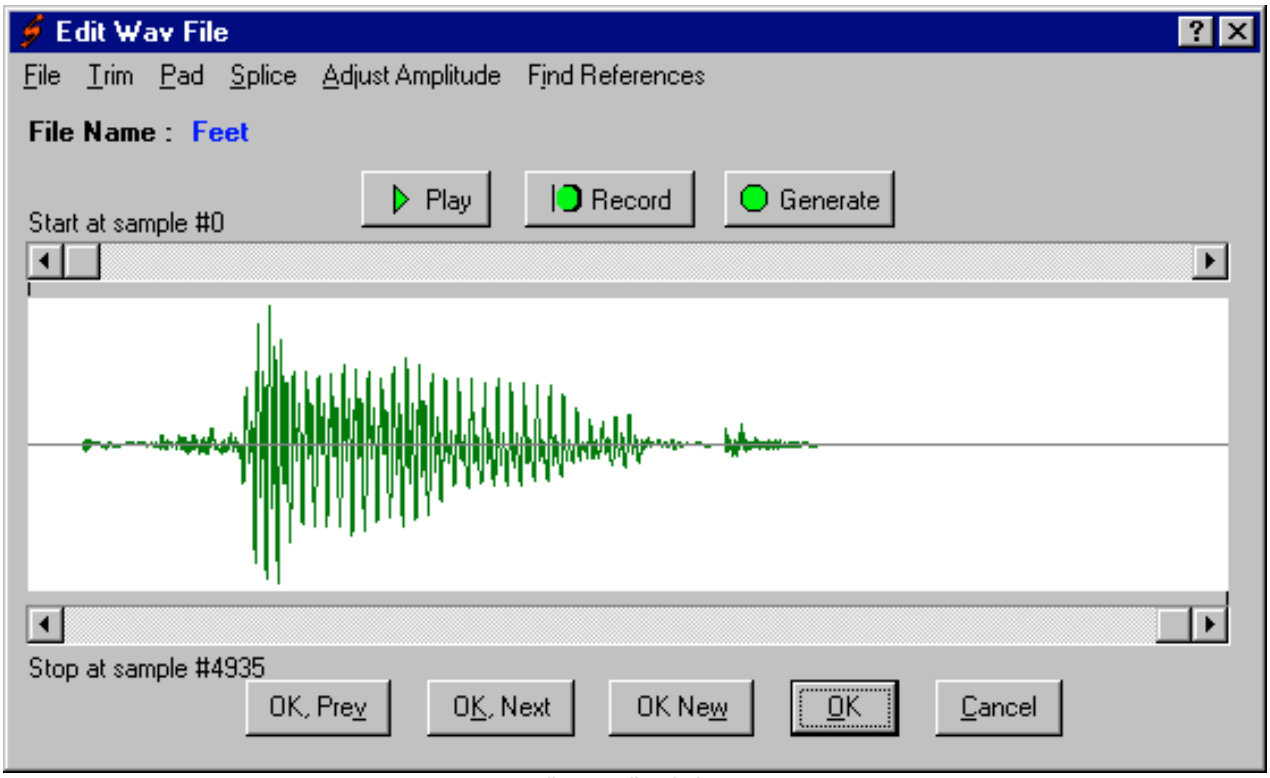
Following the steps for creating a new menu given above, the greeting message should be recorded in a new menu with a name such as **IntroMenu**.

To setup ScadaPhone to play this menu when an incoming call is answered, on the main window's menu select **Options | Incoming Calls | Initial Menu**. Enter the name of the new start menu (such as **IntroMenu**) or use the **Browse** button to open a window with a list of existing menus and select the appropriate menu name. When the correct menu name has been entered, click the **OK** button.

Editing WAV Files

WAV files are edited in Development Mode.

WAV files may be edited to eliminate beginning or ending pauses. They may also be re-recorded to change the message content entirely. WAV files are edited with the **Edit WAV File** window. This window will open when editing an alarm message segment WAV file. (Click the **Edit** button in the **Message Segment** window.) It may also be opened by selecting the **WAV files** tab on ScadaPhone's main window, selecting a WAV file name, and then clicking the **Edit** button.



Edit Wav File window

Clicking on the blue filename link above the WAV display will open the **Select WAV files** window, which allows selection of other WAV files listed on the **WAV files** tab.

Note: System WAV files may be displayed in the **Select WAV files** window by checking the **Show System WAVs** option. However, neither the content nor the name of these files should be changed. They may be re-recorded to change the voice to match other user-defined WAV files, but the message should stay the same.

The **Play** button allows the file to be played. The **Record** button allows the file to be re-recorded.

The **Generate** button will be enabled if 'text to speech' has been enabled. Clicking this button will cause the 'text to speech' subsystem to generate the wave file automatically, based on the WAV file name. If the 'Use wav files generated by 'Text to Speech ' interface' has been selected in the Text to Speech Options window, the generated wav file will be saved in the TTS directory, if not it will be saved in the project directory.
See: Text To Speech Interface

Note: The recording and playback of sound (WAV) files may be done either through the voice modem or a PC sound card. ***See:*** Setting the COM Port from the main window

To save the current WAV file and exit the **Edit WAV file** window, click the **OK** button.

To save the current WAV file and open the previously defined message on the main window's **WAV files** tab into the **Alarm Information** window, click the **OK,Previous** button.

To save the current WAV file and open the next defined message on the main window's **WAV files** tab into the **Alarm Information** window, click the **OK,Next** button.

To save the current WAV file and start a new one, click the **OK, New** button.

To exit the current WAV file without saving any changes, click the **Cancel** button.

Edit WAV File Window Menu Items

File - New
Allows entry of a new filename and recording of the new WAV file.

File - Open
Opens the Select WAV files window which allows selection of other WAV files listed on the WAV files tab. Note: System WAV files may be displayed in the Select WAV files window by checking the Show System WAVs option.

File - Save
Saves the current WAV file.

File - SaveAs
Allows the current WAV file to be saved in a new file. This copies the current WAV file to a new file with a different name.

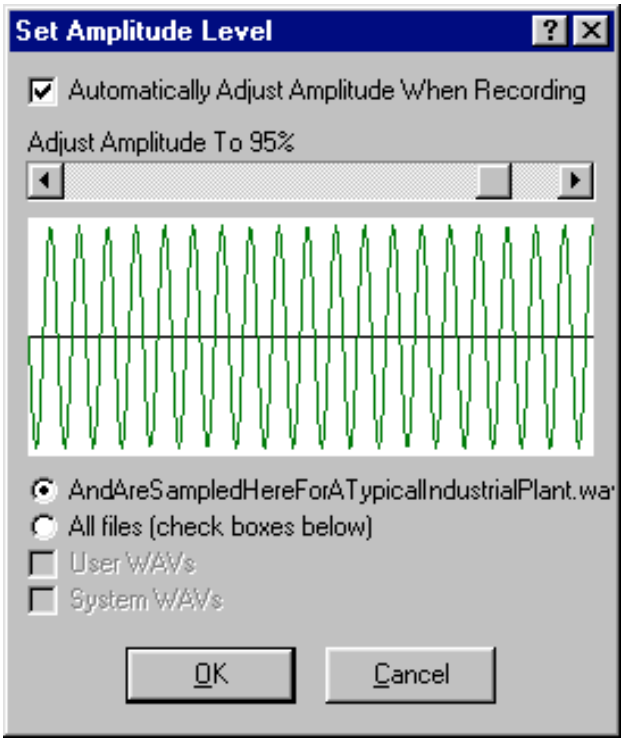
File - Reload
This menu item is enabled after changes have been made. It allows the last saved version of the WAV file to be reloaded into the editor.

Trim
Used in conjunction with the **Start at sample** and **Stop at sample** slider bars. Adjust the sliders to indicate where the beginning and/or end of the WAV file should be trimmed, then select **Trim**.

Pad
Used to add 1000 samples or 1/8th of a second of silence to the beginning or end of the WAV file.

Splice
Allows two exiting WAV files to be spliced together to form a new WAV file.

Adjust Amplitude
Opens a **Set Amplitude Level** dialog box:



This dialog box allows the selected WAV file or all WAV files to be scaled to between 50 and 100 percent of full scale amplitude. This allows the file(s) to be scaled up or down for best sound quality and volume. When a WAV file is scaled, the data points that have the largest 1% of all values are discarded. This helps to eliminate spurious spikes in the data file. This feature allows the user to scale all WAV files to the same sound level.

The radio buttons and check boxes at the bottom of the dialog box allow either the selected file or all files of a given type to be scaled. User WAVs are the sound files recorded by the user and saved with the project. These files are shown on the Wav Files tab. System files are prerecorded sound files used by system menus and are saved in the system directory and are shown on the Sys Wavs tab.

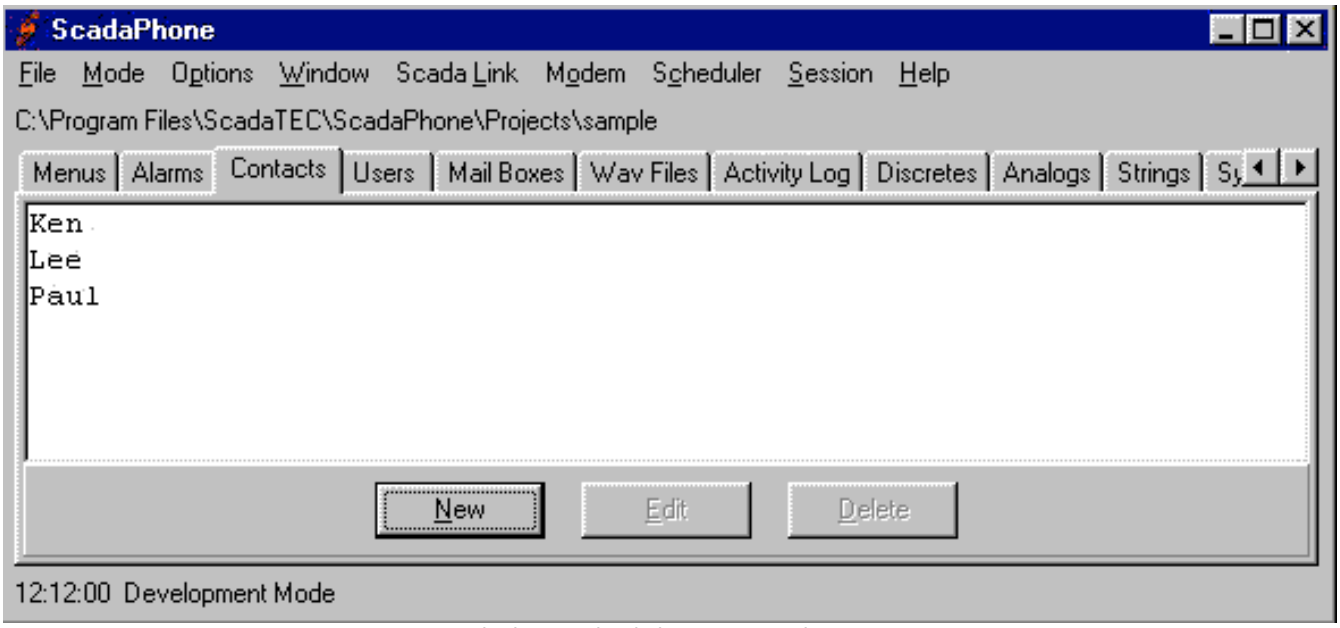
Find References
Displays a form which lists all locations where the current WAV file is used. The list includes the area, such as menus, alarms, etc., as well as the menu item for menus, and message segments. Note that the message segments are numbered with a starting value of zero rather than one.

Entering Alarm Contact Information

In ScadaPhone, the term *contact* refers to a telephone number that is to be called in the event of an alarm. In addition to the telephone number to dial, contact definitions contain call persistence settings and answer detection scripts. The call persistence setting dictates how many times or how long ScadaPhone will attempt to call and obtain alarm acknowledgements from a contact. Answer detection scripts are used to determine what action is to be taken based upon the audio signal coming from the remote telephone. ScadaPhone implements an audio signal analyzer that can distinguish between silence, tone, and voice coming from the telephone being called. Depending upon the sequence, duration, and frequency of these three signal states, ScadaPhone can be configured to respond in different ways.

Contacts must be created in Development Mode. To set up a contact, select the **Contacts** tab on the main window. When a project doesn't contain any contact information, the **Contacts** tab will display "No

Contacts Defined." Otherwise, the **Contacts** tab will display a list of previously defined contacts.



ScadaPhone main window Contacts tab

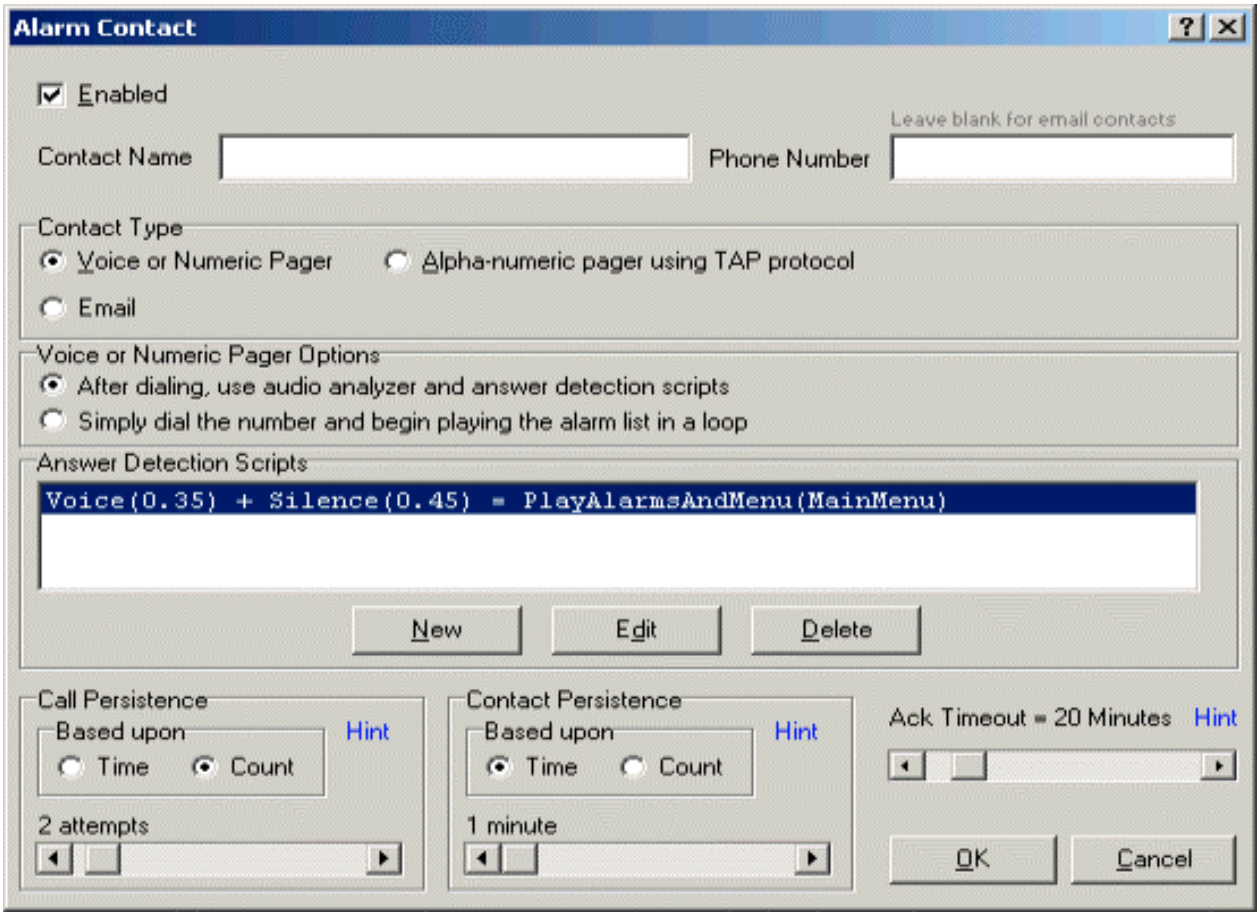
Which contacts are called and the order in which they are called is determined by the ScadaPhone **Scheduler**. *Details*: Creating a Schedule

From the **Contacts** tab on the main window, new contacts may be defined, existing contacts may be edited or deleted, and the order in which the contacts are called may be changed.

Creating Contacts

To create a new contact, click the **New** button on the main window **Contacts** tab. The Alarm Contact window will be displayed:

The Alarm Contact window



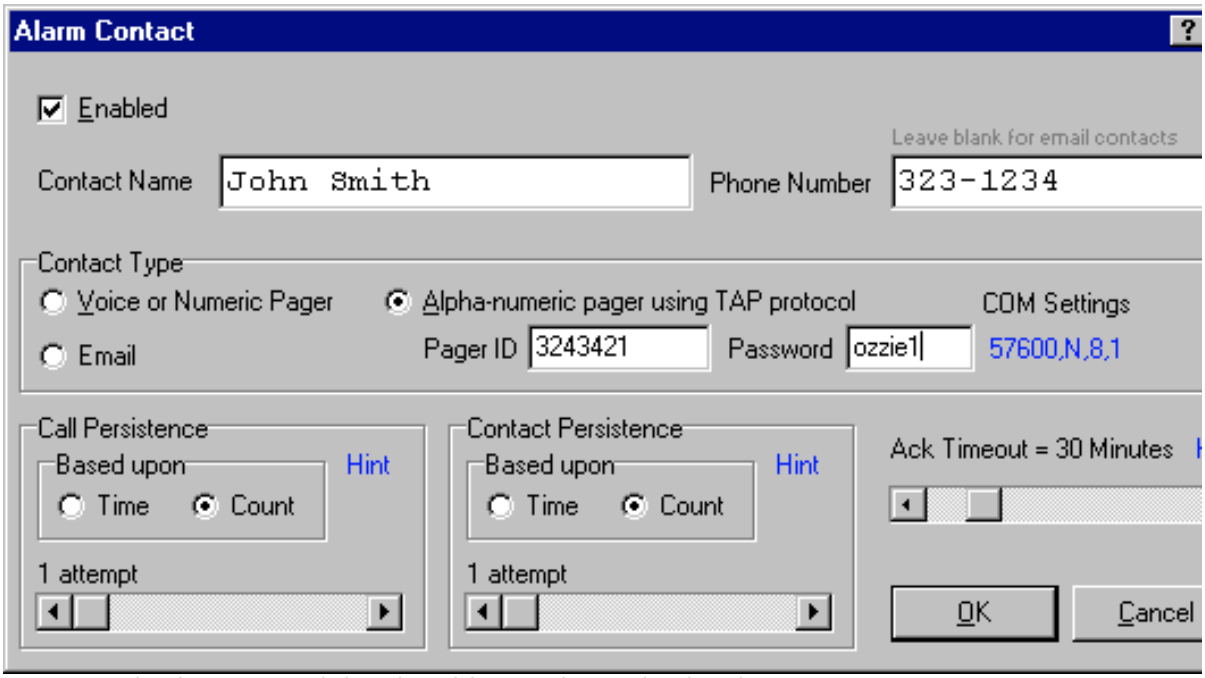
The above window is displayed when the **Voice or Numeric Pager Contact Type** is chosen. When **Alpha-numeric Pager using TAP protocol** or **Email** is chosen, the window will change, as described below.

The sections in the **Alarm Contact** window are as follows:

- ***Enabled***: When this box is checked, ScadaPhone will call this contact to report the presence of alarms.
- ***Name***: This specifies the name of this contact. This name will be displayed in the contact list and logged in the activity log.
- ***Phone Number***: This box specifies the telephone number for ScadaPhone to dial when reporting alarms.
- ***Contact Type***:
  Select one of three contact types:
  Voice or Numeric Pager
  Alpha-numeric Page using TAP protocol
  Email

  Voice or Numeric Pager
  Select the **Voice or Numeric Pager** option when ScadaPhone needs to call the contact via regular phone or call the contact's numeric pager. This option requires the creation of an **Answer Detection Script,** which determines how ScadaPhone handles outgoing (alarm reporting) telephone calls. *Details:* Answer Detection Scripts

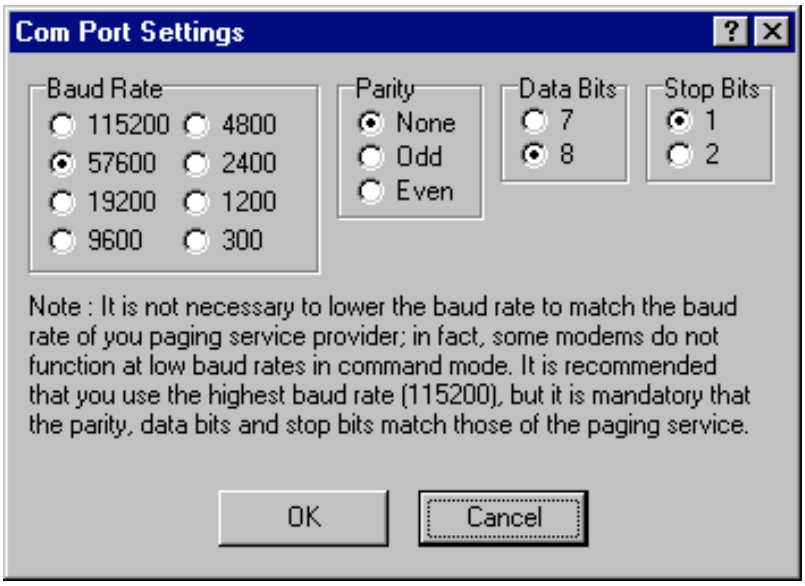
Alpha-numeric Pager using TAP protocol



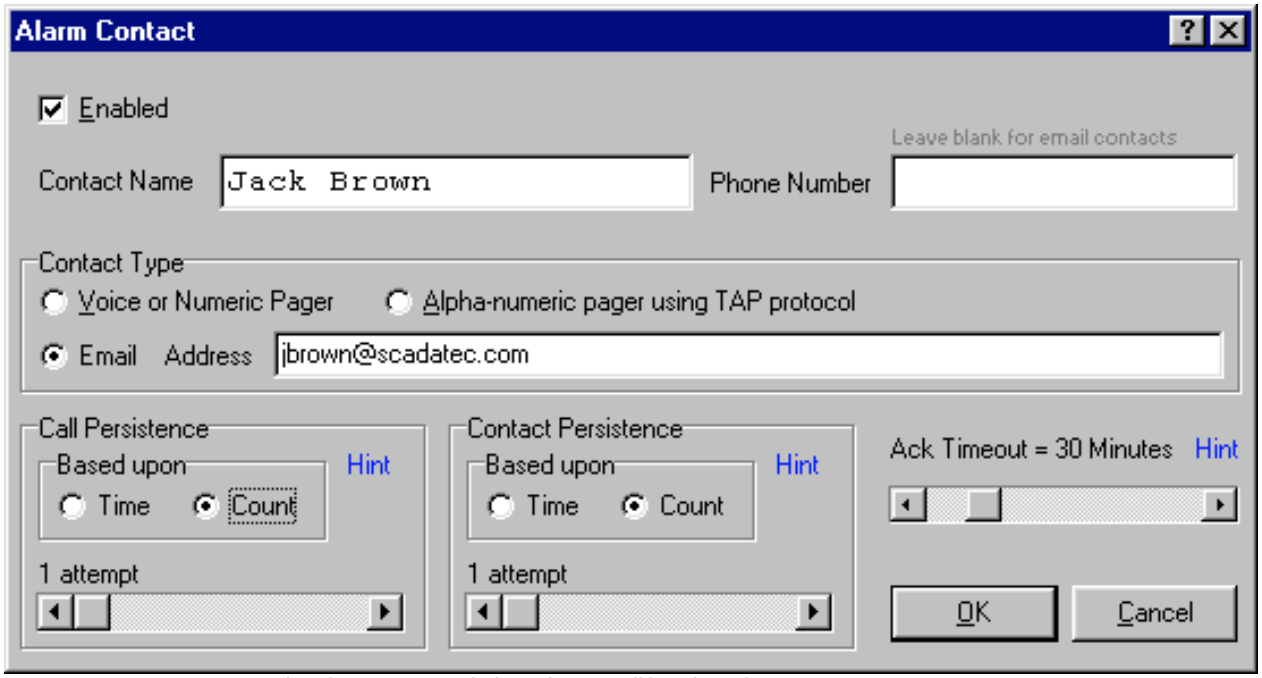
The Alarm Contact window when Alpha-numeric pager is selected

Select the **Alpha-numeric Pager using TAP protocol** option to send a text message to the contact via their alphanumeric pager. When this option is selected, the phone number for the pager service is entered into the **Phone Number** box. ScadaPhone will also display a Pager ID number box. Enter the ID number that the paging service uses to identify the pager that ScadaPhone is contacting into this box. Some alpha-numeric pager systems require a password. (Usually this is only for systems outside of the U.S.) If the system requires a password, enter the password into the **Password** box.

Adjust the **COM Settings,** if necessary, by clicking on the blue link. (The proper COM settings must be obtained from the pager service; '1200,7,E,1' is a common setting, see note in Com Port Settings form below.) When this contact is made, ScadaPhone sends the pager/phone message defined in the **Alarm Information** window to the pager.
Details: Text Message for Alpha-numeric Pagers/Phones.



Email



The Alarm Contact window when Email is selected

Select the **Email** option to have ScadaPhone send alarm notification via e-mail. When the **Email** option is selected, leave the **Phone Number** box blank. ScadaPhone will open an **Address** box. Enter the contact's e-mail address into this box. **Note**: more than one address may be entered, separated by commas. When this contact is made, ScadaPhone sends the pager/phone message defined in the **Alarm Information** window. *Details:* Text Message for Alpha-numeric Pagers/Phones. ***Note:*** When **Email** is selected, the e-mail settings must be entered via the main menu, under **Options | E-mail Settings**. *Details*: Email Settings.

- ***Voice or Numeric Pager Options***
  Select the 'After dialing, use audio analyzer and answer detection scripts' for normal operation. This is the default. Is you have a special situation in which it is desirable to bypass the audio analyzer and answer detection scripts select the second option.

- ***Call Persistence***: This box determines how long ScadaPhone will wait or how many times to attempt to get through to the contact. If ScadaPhone receives a busy signal or gets no answer when calling this contact, it will keep trying to get through until this timer expires or the count is reached (depending on which mode is selected). Select the mode of operation in the **Based Upon** box by clicking either **Time** or **Count**. Adjust the slider until the appropriate number is displayed.
- ***Contact Persistence***: This box determines how long to call or how many times to call this contact in order to receive alarm acknowledgement. If ScadaPhone calls this contact but does not receive alarm acknowledgement, it will call this contact until this timer expires or the count is reached (depending on which mode is selected). Select the mode of operation in the Based Upon box by clicking either Time or Count based operation. Adjust the slider until the appropriate number is displayed.
- ***Ack Timeout***: Use this slider if an alarm is configured to require both console and phone acknowledgment (in the Alarm Information window.). Adjust the slider to set how long ScadaPhone should wait for an alarm to be acknowledged from the console after the alarm is acknowledged from the phone, before placing another call. If the alarm is not acknowledged from the phone, ScadaPhone will continue to call contacts with no waiting period.

EnteringTag Names

Entering Tag Names

Tag names are added and edited in Development Mode.

When using ScadaPhone, in most cases a SCADA system will already be configured and tag names will be defined. Tag names used in ScadaPhone must *exactly* match the tag names in the SCADA system, unless the tag is a computed tag. *See:* Computed Tags. In addition, ScadaPhone reserves the "$" symbol for predefined system tags. If the SCADA tag name happens to begin with "$", prefix the alarm tag name with two dollar signs: "$$".

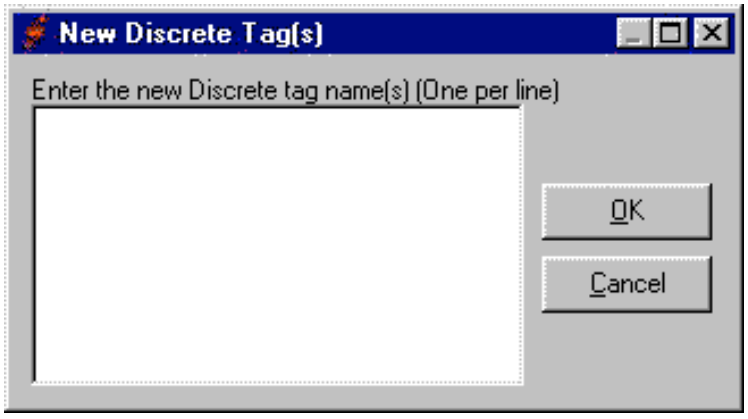
Note: If there is a text file containing the list of tag names used in the SCADA system, the standard Windows copy and paste keys may be used to enter the tag names into ScadaPhone. ***See:*** Using the Windows Clipboard. The advantage of using copy and paste is that the tag names entered into ScadaPhone will exactly match the tag names in the SCADA system, including case. This is absolutely necessary for tag data to be retrieved from the SCADA software. The exception to this is if the optional ScadaLink alias is used. In that case the tag name may be any valid tag name as long as the tag name used in the SCADA software is entered into the ScadaLink Alias field in the tab properties dialog.

Note1: Valid tag names in ScadaPhone must begin with one of the following characters: **A..Z, a..z, $, _, \, [** the following characters may include **letters**, **numbers, spaces**, and the following **special characters**: **:, ., |, µ,], #, &, %, -, /, <, >, =**.

Note2: If ScadaPhone encounters a tag name that is not valid in ScadaPhone during import or when

entered manually it will create a valid alias for use within ScadaPhone by placing an underscore in front of the tag name (/tag1 becomes _/tag1). The alias will be used within ScadaPhone but the original tag name will be used when communicating with the SCADA software.

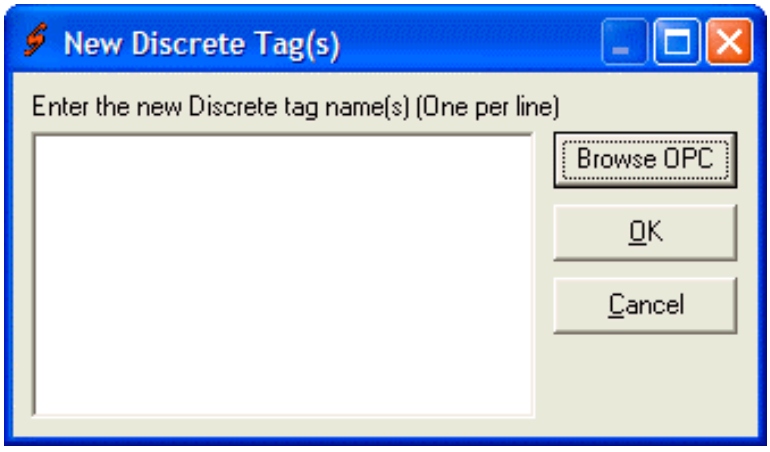
Analog, Discrete, or String Tag Names are entered the same way. From the main ScadaPhone window, select either the **Analogs, Discretes,** or **Strings** tab. Next, click the **New** menu item on the main screen's top menu. This will open a window for entering tag names:



Tag names may be either typed or pasted into the text box, one tag name per line. If Citect has been selected in ScadaLink Setup, one additional button will appear labeled 'Browse Citect', clicking on the button will allow you to select and import tags and alarms from the Citect SCADA software. In order for this to work the Citect runtime must be running.

Note: The OPC Browser filters the browsing operation if iFix is the designated server. By default, only tags ending in .F_CV are returned into the OPC Browser; however the user can select any of the other iFix tag suffixes (e.g. A_NALM, F_LO, etc...) by clicking on the blue hyperlink at the bottom of the OPC Tag Browser (this link is only visible if iFix is selected in the ScadLink Setup).

If ScadaLink is set to OPC a different button will appear labeled Browse OPC. If the configured OPC server supports namespace browsing, the tags from that server will be listed in a new browsing window.



Click the **OK** button when finished.

Upon returning to the main window, new tags are listed, but they are shown in gray. The gray color indicates that they are not referenced by any alarm or menu.

The main advantage of entering tags before creating alarm messages or menus is that it eliminates typing when adding the tag names to alarms or menus. Tag names that appear on the ScadaPhone main tab panes are available via the **Browse** button in the windows used for creating alarm messages or menus.

Note1: Once a tag name is entered on a tab pane, it may not be edited, only removed. If a tag name is gray, it may be removed by selecting the tag and clicking **Remove** on the bottom menu. If a tag name is being used in an alarm or a menu (as indicated by a black color), it must be removed from the alarm or menu before it can be removed from the tab pane.

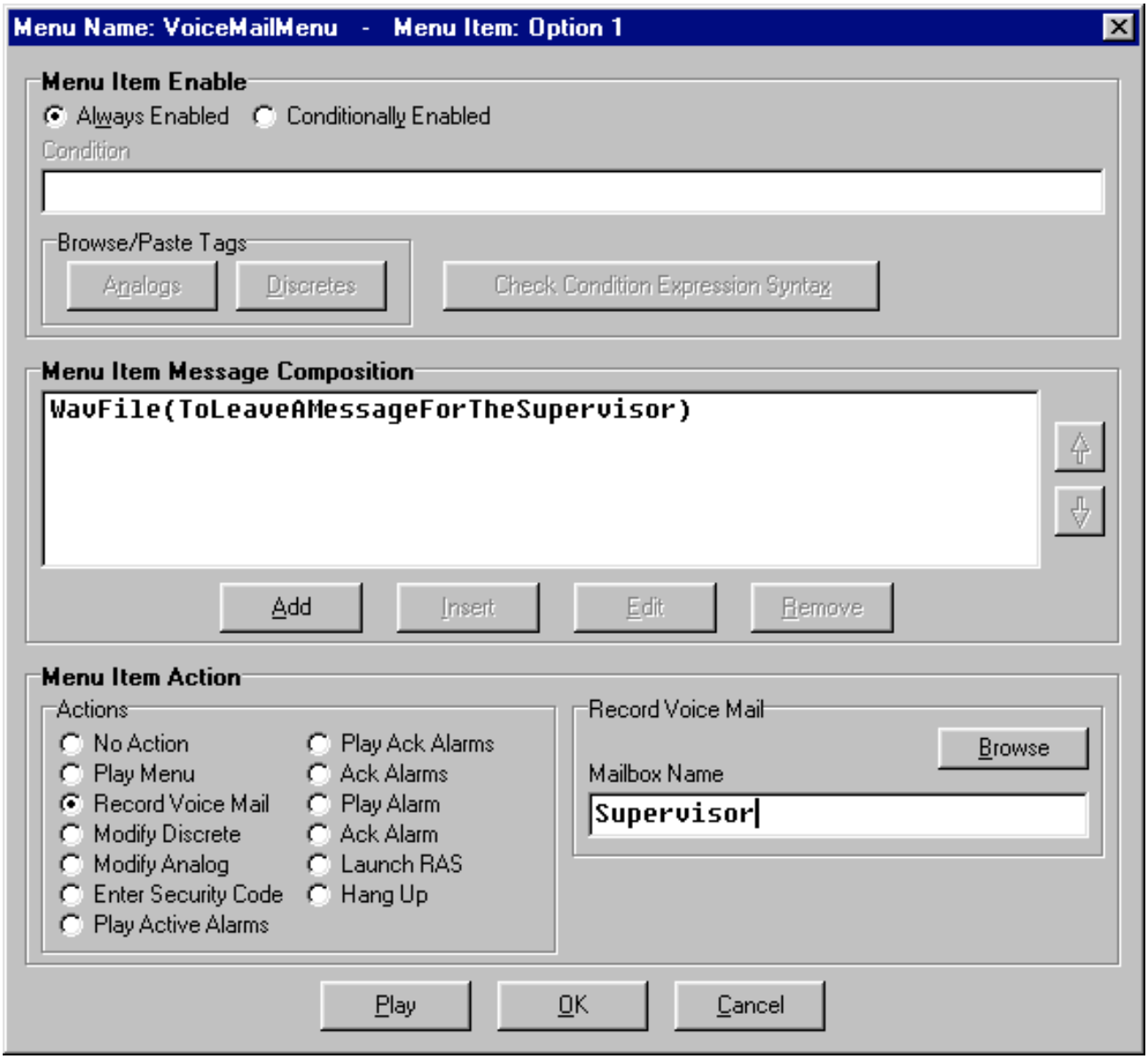
Note2: If an analog tag is inadvertently imported into the discrete tab ScadaPhone will pop up the 'Discrete Expected Analog Received' window during runtime when analog data is received. The 'Discrete Expected Analog Received' window has 2 new buttons: 'Change To Analog' and 'Find References'. the 'Change To Analog' button allows the user to change the data type from discrete to analog (on unused tags only). This situation usually occurs when a system designer grabs the entire list of tags from the OPC Tag Browser and inserts all of them into the Discretes Tab. ScadaPhone does not complain about the analog tags in the discrete list until the ScadaLink is fired-up in run mode and analog values start coming back from the server.

This feature can be exploited by doing the following: Start with a blank project (no alarms, menus, or tags), configure the appropriate ScadaLink, go to the Discretes Tab, click the New button, click the Browse OPC button, select all of the tags and click OK, enter run mode, wait for the Discrete Expected Analog Received window to fill up with errant analogs (this may not catch all of the analogs if they return a value of zero or one which are valid discrete values), select the entire contents of the Discrete Expected Analog Received list (it's a multi-select list), click the Change To Analog button. Note that this data type change can only be performed on unused tags (not used in any alarms or menus). If one of the tags in the type mismatch list is being used, the user can highlight it and click the Find References button to see where it is being used and, if necessary, change the context in which it is being used (analog vs. discrete).
Related Topics:
Tag Properties
Modifying Tag Values

Mail Boxes

Creating a Mail Box

Mail boxes are created when the **Menu Item Action** in the **Menu Item** window is set to **Record Voice Mail** and a new mail box name is entered.



Example: Creating a Supervisor mail box

For details on creating menus to record voice mail ***see***:
Voice Mail Example
Adding and Editing Menus

Opening a Mail Box

See: Retrieving Voice Mail

Deleting a Mail Box

To remove a mail box, it must not be currently used in any menu. An entire menu for voice mail may be deleted, or the option for the single mail box may be cleared. *See:* Voice Mail Example

To remove an unused mail box, highlight the mail box name on the **Mail Boxes** tab of the main window and click the **Delete** button.

Modifying Tag Values

Modifying Tag Values from the Console

Tag values may be modified either in Run Mode or in Development Mode.

If a SCADA link tag value is modified in Development Mode, its value is only changed in ScadaPhone. If a SCADA link tag value is modified in Run Mode, the value of the tag will be changed in both ScadaPhone and the SCADA system.

To modify a discrete tag value, select the **Discretes** tab from ScadaPhone's main window. Select the tag name and click the **Invert** button to toggle the value from FALSE to TRUE or from TRUE to FALSE.

To modify an analog tag value, select the **Analogs** tab from ScadaPhone's main window. Select the tag name and click the **Modify** button. Enter the new tag value and click the **OK** button. **Note**: an invalid analog tag value (such as text) will be displayed in red and the **OK** button will be grayed out until a valid value is entered.

To modify a string tag value, select the **Strings** tab from ScadaPhone's main window. Select the tag name and click the **Modify** button. Enter the new tag value and click the **OK** button.

Modifying Tag Values Via the Telephone

ScadaPhone allows callers to modify SCADA system analog and discrete values over the phone. This feature is accomplished via the **Modify Discrete** and **Modify Analog** menu item actions. When menu options defined with these actions are selected, ScadaPhone 'pokes' data through the SCADA link interface into the SCADA system.

For details on creating a menu to allow the caller to modify tag values, ***see***:
Creating and Editing Phone Menus
Modify Analog
Modify Discrete

When a menu option has been enabled to allow a caller to modify a discrete value, ScadaPhone will present the caller with a message similar to this: "*To modify the Control Bit, press five.*" When the caller presses the appropriate telephone key, ScadaPhone will announce, "*To set the Bit on, press 1. To set the Bit off, press 0. To cancel, press star.*" Pressing 1 sets the discrete value as 1 or TRUE. Pressing 0 sets the discrete value as 0 or FALSE.

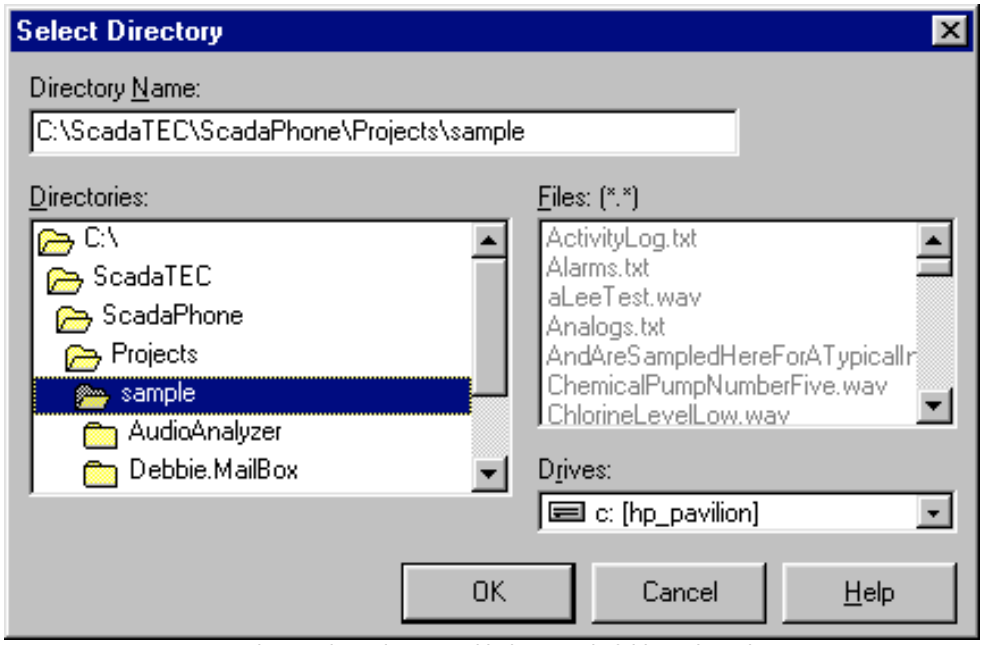
When a menu option has been enabled to allow a caller to modify an analog value, ScadaPhone will present the caller with a message similar to this: "*To modify the Set Point, press four.*" When the caller presses the appropriate telephone key, ScadaPhone will announce, "*Enter number followed by pound sign. To indicate a decimal point, press star. To clear input and start again, press star twice. To abort input, press star three times.*" When the caller enters a number, they are presented with the **Confirm Analog Menu**. ScadaPhone announces, "*If this is correct, press 1. If this is not correct and you want to enter it again, press 2. To cancel, press star.*" When the caller presses 1, the analog value is reset with the new value.

Opening an Existing Project

ScadaPhone must be in Development Mode to open an existing project.

To open a project, select from the main screen's top menu **File | Project | Load/New.** This will open the

Select Directory window:



Select Project Directory with the sample folder selected

Click the down arrow to the right of the **Drives** box to select the correct drive (if needed.) In the **Directories** box, double click the project folder name and click **OK**. Opening the folder opens the project. ScadaPhone will return to the main window with the project loaded.

Related Topic: Setting up a Project

Removing Unused Tags

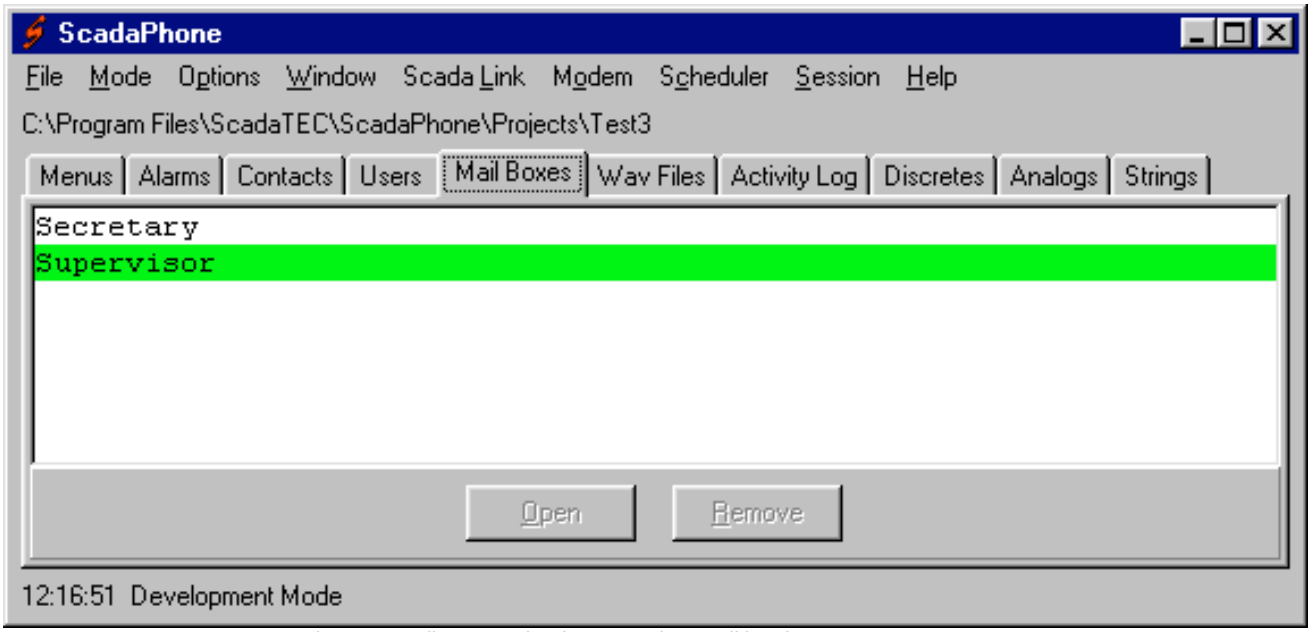
Tag names may be removed in Development Mode. To remove tags, first select the **Discretes**, **Analogs**, or **Strings** tab from the main window.

Unused tag names appear in gray on a tab. Only unused tags may be removed. If a tag name is being used in an alarm or a menu (as indicated by a black color), it must be removed from the alarm or menu before it can be removed from the tab pane. Either a single tag or all the unused tags appearing on the current tab may be removed. Select the tag to be removed (or any gray tag name if all are to be removed) and click the **Remove** button on the bottom menu. This will open the **Remove Unused Tags** window:

Select the correct option to remove either the selected tag or all unused tags. Click the **OK** button when done.

Retrieving Voice Mail

To retrieve voice mail from the computer console, first select the **Mail Boxes** tab on ScadaPhone's main window. Mailboxes are displayed with a green background when there are new messages:



Main menu Mail Boxes tab -the Supervisor mail box has new messages

To listen to the voice mail messages, double click on the mail box name. This will open the **Mail Box** window:

The Mail Box window for the Supervisor

Messages are placed into WAV files. The WAV files are time-stamped to indicate the date and time when the message was recorded. To hear voice mail messages, highlight the desired message and click the **Play** button. Delete old messages by highlighting them and clicking the **Remove** button. Click the **Close** button to return to the ScadaPhone main window.

Running a Project

Once a project is configured, it may be switched to Run Mode. In Run Mode, ScadaPhone repetitiously scans the list of alarms to see if any alarm has triggered. If an alarm has triggered (i.e. the alarm bit has been active for a period of time greater than or equal to the Signal Filtering time defined in the Alarm Information window), ScadaPhone will consult the Scheduler to see what action is to be taken (call next contact immediately, announce alarm over the modem speaker before calling, etc.)

To run a project:
1. Verify that the modem is properly connected and turned on.
2. Start ScadaPhone.
3. If the current project is not the desired project, in Development Mode, open the project.
    - Select **File | Project | Load/New.** *Details*: Opening an Existing Project
4. Verify the ScadaLink setup and that the enabled box is selected
    - Select **SCADA Link | Setup.** *Details*: The SCADA Link Interface
5. Switch to Runtime mode.
    - Select **Mode | Runtime** from the main menu.
6. Check the ScadaLink status to verify that the tags are being updated.
    - Select **Scada Link | Status** to open the **SCADA Link Status** window. When a link is working, the tag names referenced in the active project will cycle to the right of the **Tag Name** label.

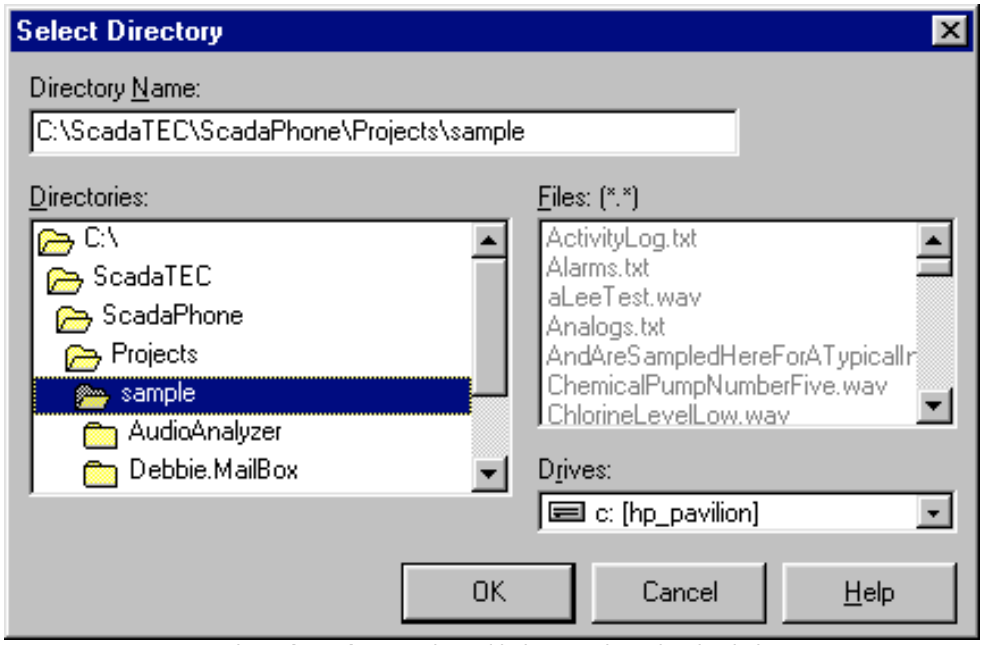
Saving a Project

Projects are saved in Development Mode.

To save a project, click **File | Project | Save** from the main screen's top menu.

To save a project with a new name and/or to a different folder, click **File | Project | Save As** from the main screen's top menu. This opens the **Save Directory** window:

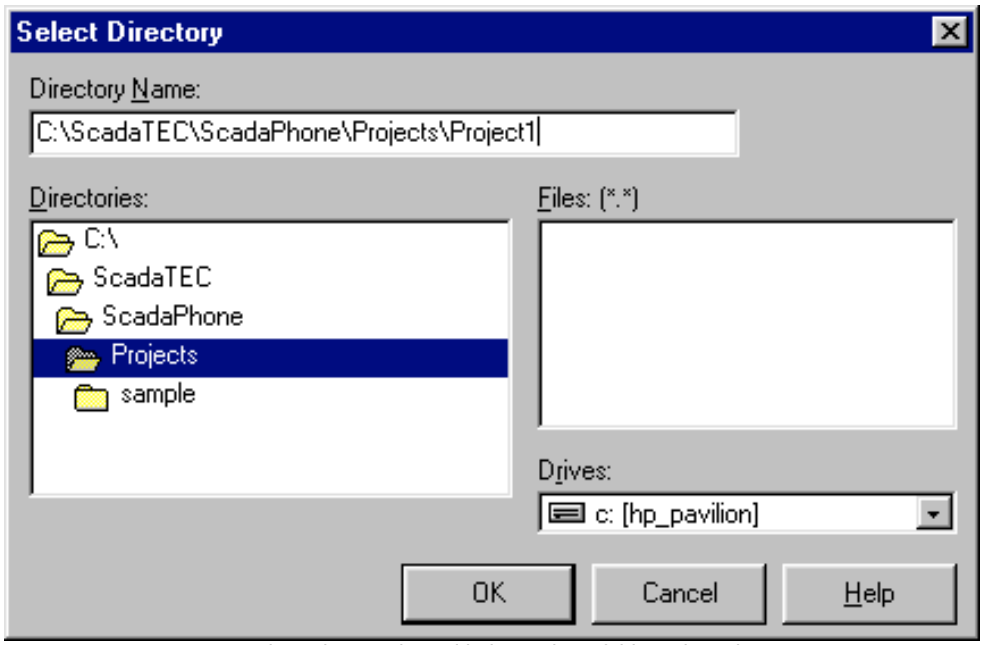
Each time a ScadaPhone project is saved, an archived copy of the project being overwritten (if it exists) is automatically zipped and stored in the 'AutoBackups' sub-folder. These zipped backups will be erased after 30 days (if there are more than 10 archives total). These backups may be restored using the Restore feature, **File|Project|Restore**



The **Select Directory** box with the sample project loaded

To save the project with a new name and/or location:

1. Click the down arrow to the right of the **Drives** box to select the correct drive (if needed.)
2. In the **Directories** box, double click the parent folder for the new location. (This will usually be the **Projects** folder.)
3. Click at the end of the pathname in the **Directory Name** box
4. Type a backslash (\) followed by the new project name at the end of the directory box. In the example below, the project is being being saved with the name **Project1** under the Projects folder:



Select Directory box with the Projects folder selected
and a new name of Project1

When done entering the project name, click the **OK** button. ScadaPhone will return to the main window, creating the necessary new folders for the new project name and location.

Note: If an existing folder name is selected when using the **Save As** command, ScadaPhone overwrites all data stored in the folder with the data for the current project.

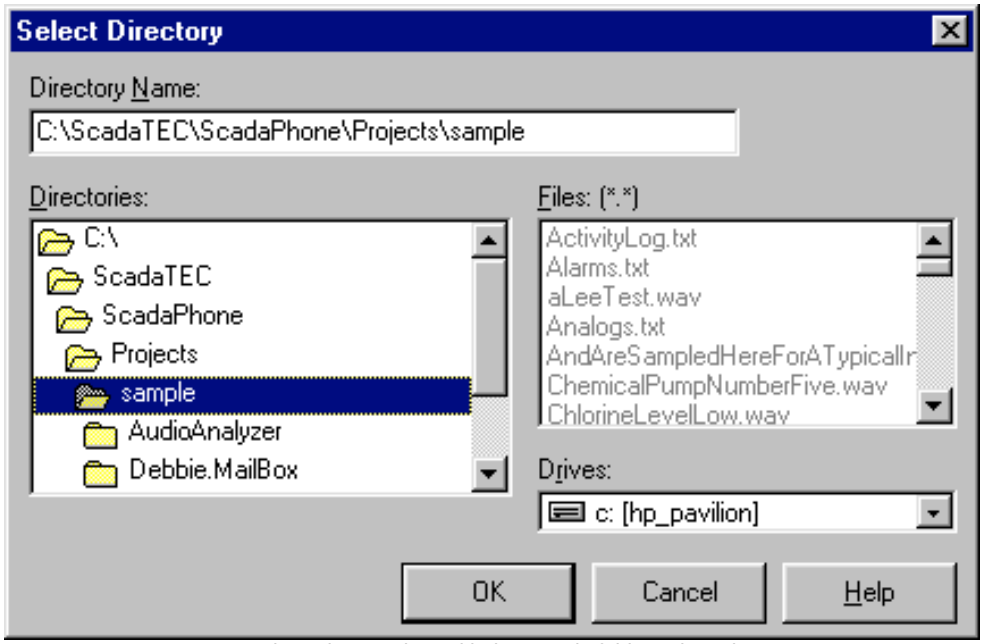
Setting up a Project

ScadaPhone organizes projects by grouping project definition files into a project folder (or project directory). Project definition files include text files (containing definitions of alarms, menus, telephone contacts, etc.), as well as WAV files (containing the voice messages that enunciate alarm and menu messages). A typical project folder will contain a few text files (Alarms.txt, Menus.txt, Contacts.txt, and so forth) and a few dozen WAV files. Unless you are a system integrator who designs numerous SCADA systems for numerous clients, you will probably only need to create one project folder for your SCADA system. If you are a system integrator with numerous clients, project folders allow you to keep your various projects separated and organized.

Creating a Project Folder

ScadaPhone must be switched to Development Mode to create a new project. The status line at the bottom of ScadaPhone's main window displays 'Development Mode' or 'Run Mode' depending on which mode is current. If ScadaPhone is in Run Mode, to switch to Development Mode click **Mode** on the main screen's top menu and select **Development**.

To create a new project, select from the main screen's top menu **File | Project | Load/New**. This will open the **Select Directory** window:

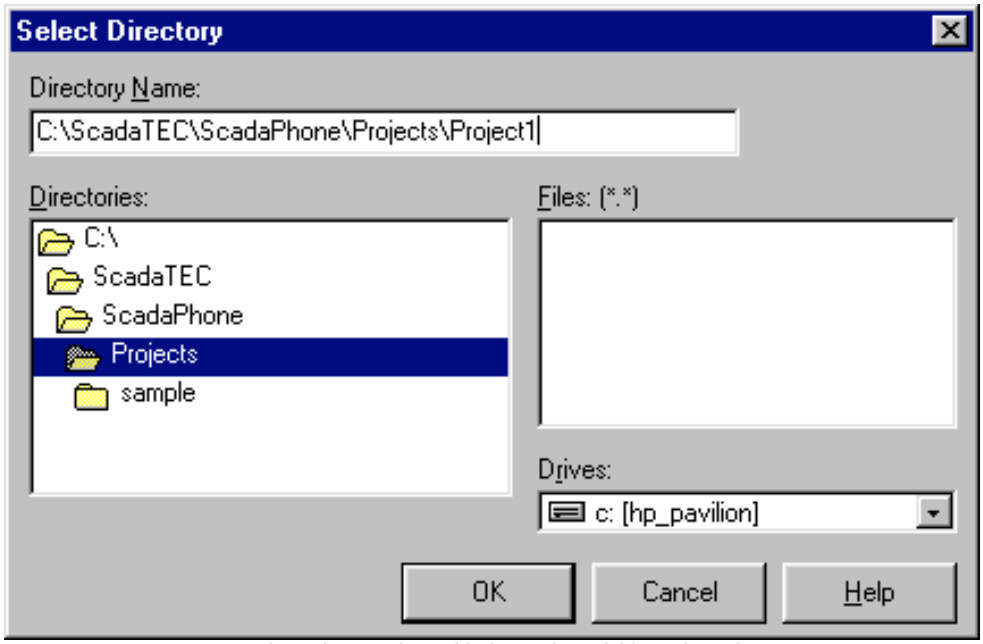


Select Directory box with the sample folder selected

To create a new project:

1. Click the down arrow to the right of the **Drives** box to select the correct drive (if needed.)
2. In the **Directories** box, double click the parent folder for the new project. (This will usually be the **Projects** folder.)

3. Click at the end of the pathname in the **Directory Name** box
4. Type a backslash (\) followed by the project name at the end of the directory box. In the example below, a new project named **Project1** under the Projects folder is being created:



Select Directory box with the Projects folder selected
and a new Project1 added

When done entering the project name, click the **OK** button. ScadaPhone will open a popup box asking for confirmation to create the specified directory. Click the **Yes** button. ScadaPhone will return to the main window, creating the necessary new folders and new project definition files for the project.

Setting up the Modem COM Port

During development of a project, the use of the modem is optional. The recording and playback of sound (WAV) files may be done either through the voice modem or a PC sound card. If a sound card is used, the COM port does not need to be set. However, before running a ScadaPhone project, the COM port must be set.

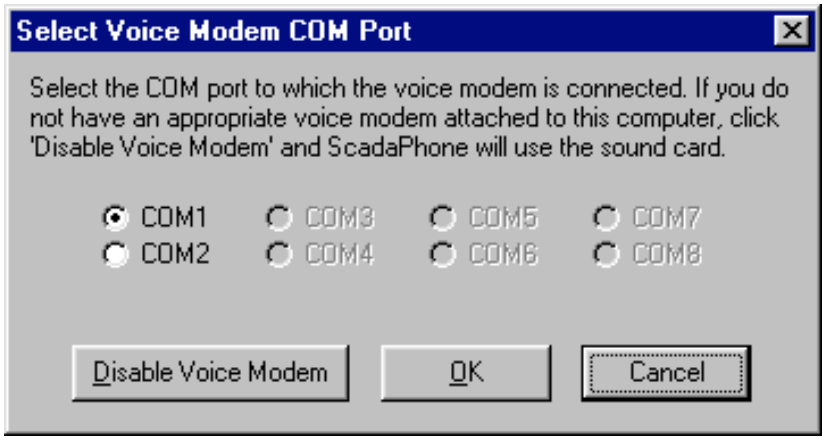
Most of the time the system will automatically detect the modem and the port it is plugged into. But in the event this does not happen, the port will need to be manually selected.

Setting the COM Port from the Main Window

The modem COM port may be set up from ScadaPhone's main window. Open the **Modem Window** by selecting **Modem** from the main screen's top menu. Then select **Port** from the **Modem Window's** top menu. This opens the **Select Port** window.

Setting the COM Port in the Select Port Window

The **Select Port** window displays which COM ports are available:



The Select Voice Modem COM Port with COM1 selected

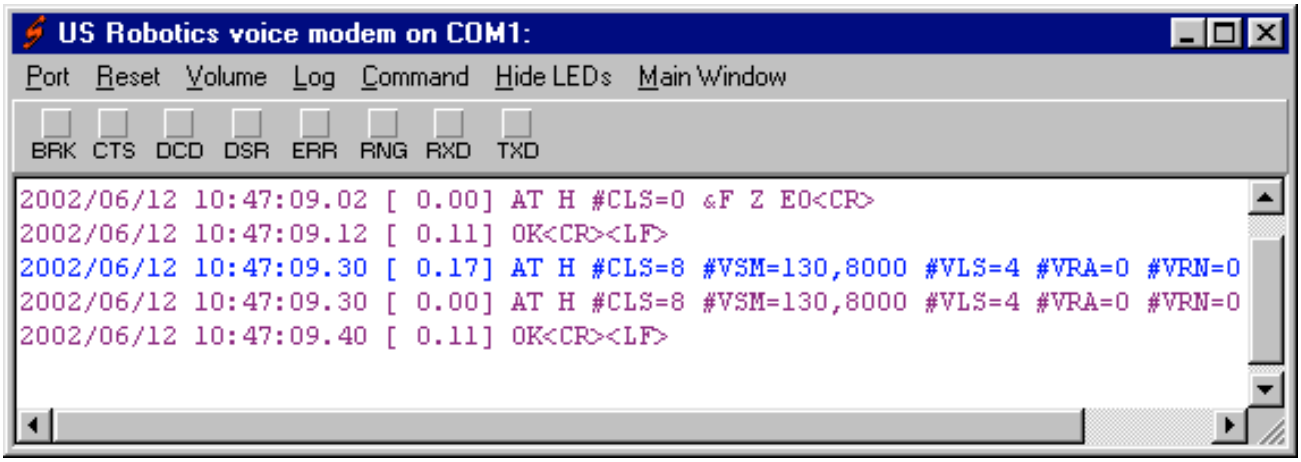
To use the PC sound card for the recording and playback of sound (WAV) files rather than the modem, click the **Disable Voice Modem** button.

COM ports that are not available are grayed out. Click the radio button corresponding to the COM port to which the modem is attached and click **OK**.

If the **Select Port** window was accessed from the **Modem Window**, when **OK** is clicked ScadaPhone will return to the **Modem Window**. Otherwise, ScadaPhone will return to the main window.

Testing the Modem Connection

The modem connection may be tested from the **Modem Window**. To open the **Modem Window**, select **Modem** from ScadaPhone's top menu:



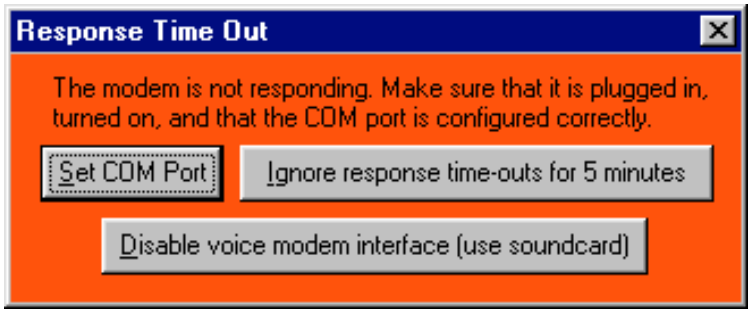
The modem window

To check that the modem is connected properly, click on the **Reset** menu item. There should be some activity in the **Modem Window** log. The last line should display "<DLE>h" or "OK<CR><LF>". This indicates that the modem is ready. The display should NOT show "ERROR<CR><LF>".

Setting the COM Port from Error Windows

Response Time Out Window

ScadaPhone needs to be connected to the correct COM port. The software may automatically detect the right port. If not, the **Response Time-out** window will be displayed at program start-up when ScadaPhone attempts to reset the modem:

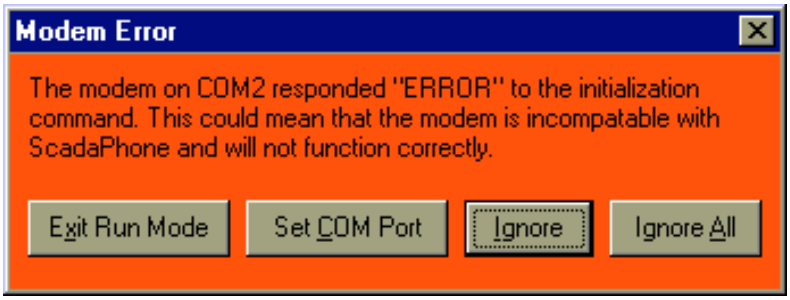


To use the PC sound card for the recording and playback of sound (WAV) files rather than the modem, click the **Disable voice modem interface** button.

Click the Set COM port button to display the **Select Port** window. This window can also be accessed from ScadaPhone's top menu under **Modem,** then select **Port** from the Modem window.

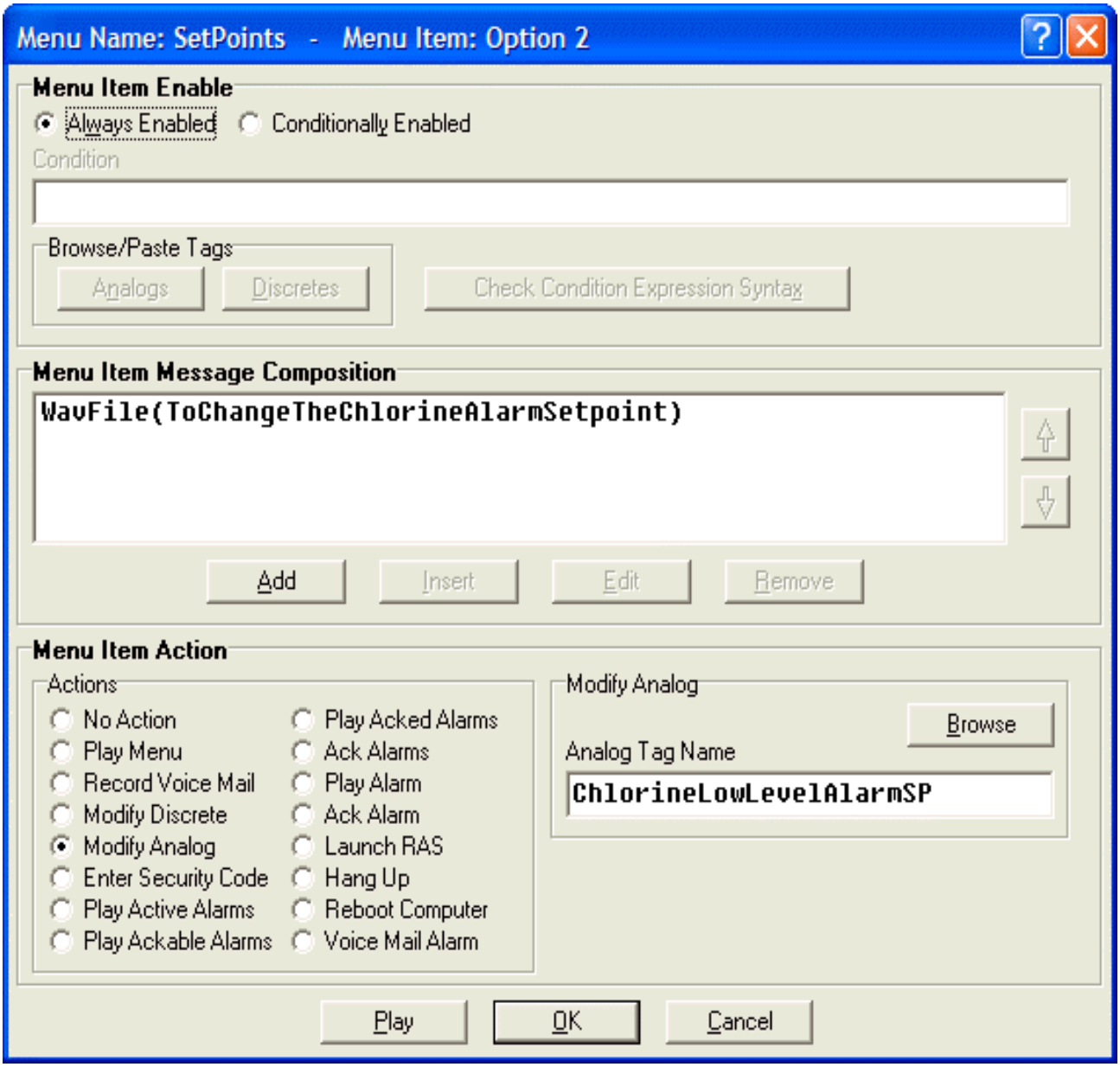
Modem Error Window

Another possibility at program start-up is that ScadaPhone will be configured to a COM port that is connected to a modem that does not use one of the supported voice modem command sets. In this event, the modem will most likely respond "ERROR" to one of the voice modem commands issued by ScadaPhone. If this happens, the **Modem Error** window will be displayed:



If one of the supported modems is being used, the problem may be able to be fixed by clicking on the **Set COM Port** button. Use the **Select Port** window to manually set the COM port. If this does not fix the problem, contact ScadaTec support. ***See****:* Contact ScadaTec

System Menu Action Items Reference



The Menu Item window with the Menu Item Action pane at the bottom

When a caller selects a menu item, ScadaPhone will perform a specific action. There are fourteen possible actions for a menu item to perform. It is recommended that user-defined menus use only the first five or the last three. The remaining actions are utilized by ScadaPhone's default MainMenu structure. Incorporating them into user-defined menus could have an adverse effect on the MainMenu and therefore is not recommended. However, they are described here for reference:

- **Enter Security Code**: Opens a submenu ($EnterCodeMenu) that allows the caller to enter their security code.
- **Play Active Alarms**: Plays the messages for all current active alarms
- **Play Ack Alarms**: Plays the messages for all current alarms requiring acknowledgement
- **Ack Alarms**: Opens a submenu ($AlarmAckMenu) that allows the caller to acknowledge alarms. This also displays a **Hang Up** checkbox. When this checkbox is checked, after the caller acknowledges the alarm ScadaPhone hangs up.

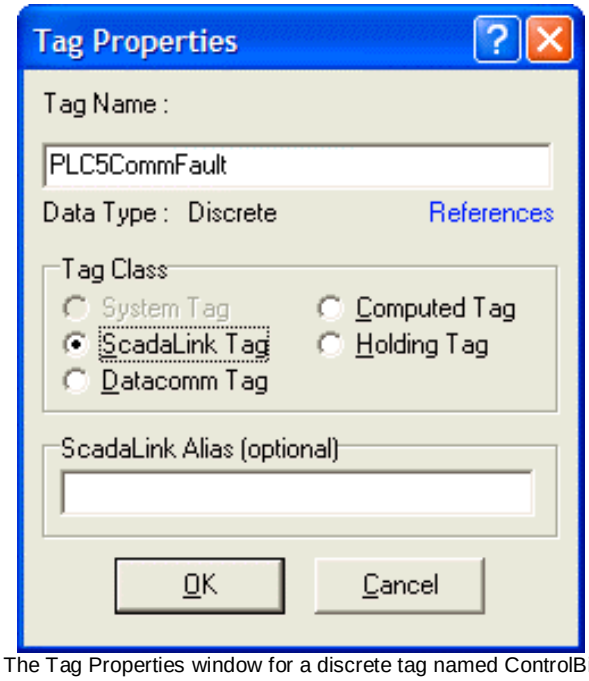
- **Play Alarm**: Plays the message for the next active alarm
- **Ack Alarm**: Opens a submenu ($InvidualAlarmAckMenu) that allows the caller to acknowledge the next active alarm

For information about the remaining menu items, *see:* Menu Item Action

Tag Properties

Tag properties are viewed and edited in Development Mode.

The properties of a tag listed on a tab in the main window may be viewed by selecting the tag name and clicking the **Properties** button. This will open the **Tag Properties** window:



The Tag Properties window for a discrete tag named ControlBit

The name of the tag, the data type, and the tag class are displayed. A tag may be one of the following classes:

- **System Tag**: These are tag names used by the ScadaPhone program. These tags should not be changed.
- **ScadaLink Tag**: These are tag names from the SCADA system, which allow ScadaPhone to retrieve tag data
- **Data Comm**: This class is not yet implemented. These are tags used to retrieve data directly from PLC's (Programmable Logic Controllers).
- **Computed Tags**: These tags hold the results of a computation. When this property is select, the **Tag Properties** window opens a lower pane. *Details*: Computed Tags
- **Holding Tags**: These tags are used to hold fixed values and are often used in comparisons and in the computations for computed tags. Holding tags may be analog, discrete, or string values.
- **ScadaLink Alias:** This field allows the tag name to be different than the datalink "Data Source" field which ScadaPhone uses to request the tag information from the SCADA software. ScadaPhone will use the name in the ScadaLink Alias field as the tag name to request the tag data but use the name in the "Tag Name" field for display within ScadaPhone. For instance, In

a ScadAlarm project, the Tag Name may be something like "**Lewis_Ave_Main_Pressure**" and the Data Source may be "**[alarmlist.xls]Sheet1|R0205C005**". A list of more than 1000 tags in the format of the aforementioned DataSource are very repetitive and hard read when trying to find a particular tag. By using the ScadaLinkAlias to hold the less descriptive string and setting the Tag Name to a more descriptive string, the alarm list displayed on screen is more readable.

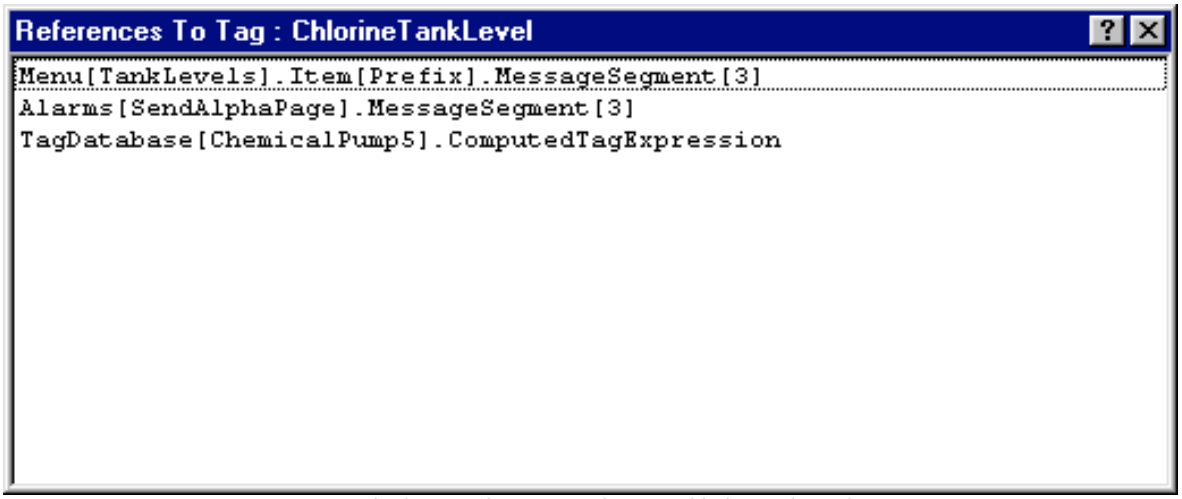
When a new tag is created, it is assigned the ScadaLink Tag class. Change the class by clicking the correct option button.

Clicking the blue References link will open the **References to Tag** window, which lists all the places the tag is used within the ScadaPhone project. *Details*: Tag References

Related Topics:
Entering Tag Names
Modify Tag Values

Tag References

Tag references provide a method to find every place a tag is used within a ScadaPhone project. Tag references can be seen by selecting a tag name on the **Discretes**, **Analogs**, or **Strings** tab and clicking the **References** button. They may also be seen from the **Tag Properties** dialog box by clicking the blue **References** link. This will open the **References to Tag** window:



ScadaPhone References to the Tag ChlorineTankLevel

In the above example, the tag ChlorineTankLevel is used three times within the ScadaPhone project:

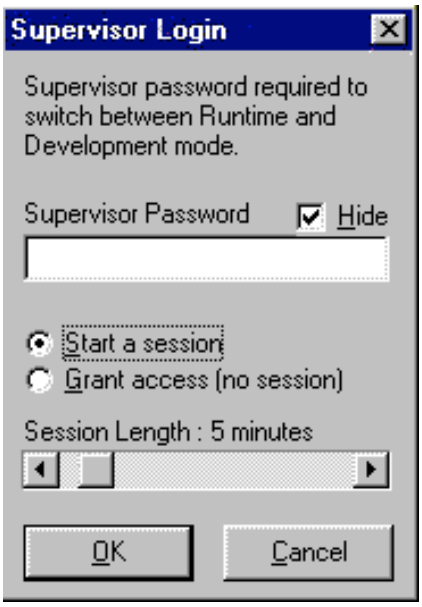
1. ChlorineTankLevel is used in the TankLevels menu in that menu's prefix menu item. The tag is used in the third message segment in the **Menu Item Message Composition** box.

2. ChlorineTankLevel is used in the SendAlphaPage alarm. The tag is used in the third message segment in the **Voice Message Composition** box.

3. ChlorineTankLevel is used as part of a Computed Tag, ChemicalPump5. Examining the properties of ChemicalPump5 shows this computation: ChlorineTankLevel<=ChlorineLowLevelAlarmSP. *Details*: Computed Tags

Testing Alarm Callouts in Run Mode

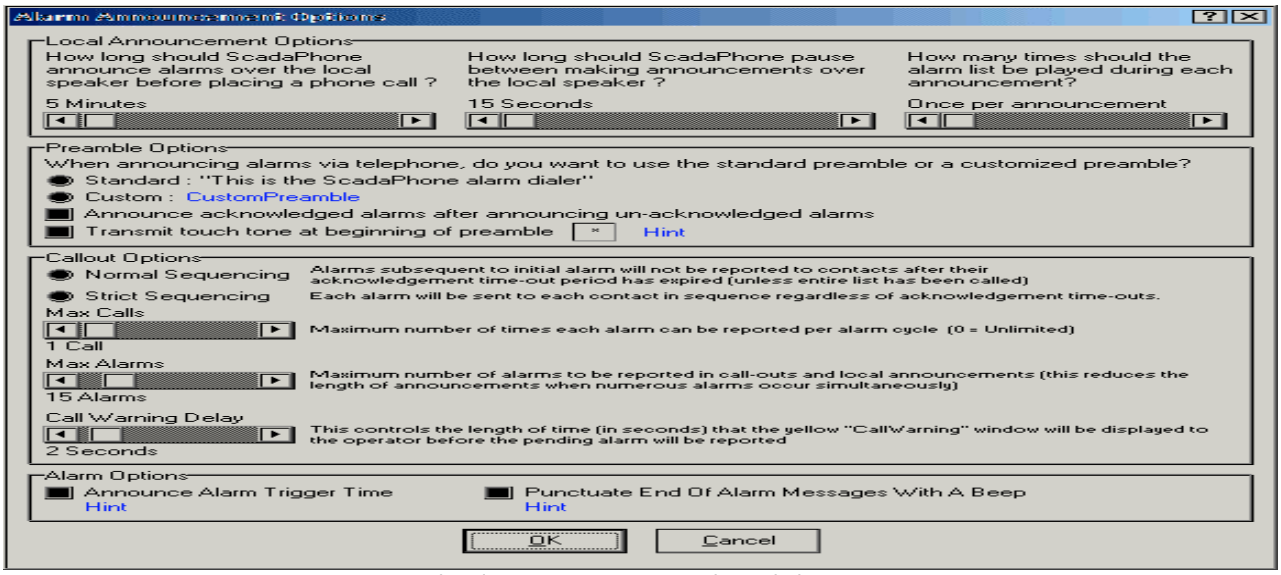
After a ScadaPhone project has been set up, it should be tested in Run Mode. Switch to Run Mode by clicking **Mode | Runtime** from the main window's top menu. Switching modes requires a password, therefore the **Supervisor Login** window will appear:



Login using the supervisor password for this project. (***See**:* Create a User's List.) For testing, select **Start a session** and use the scrollbar to set the **Session Length** to one hour. This will prevent ScadaPhone from asking for a password for every protected action. Upon successfully logging in, the status line at the bottom of ScadaPhone's main window should read **Run Mode: Idle**.

In Run Mode, ScadaPhone repeatedly scans the list of alarms to see if an alarm has been triggered. If an alarm has triggered (i.e. the alarm has been active for a period of time greater than or equal to the Signal Filtering time defined in the Alarm Information window), ScadaPhone will consult the action schedule to see what action is to be taken (call next contact immediately, announce alarm over the modem speaker before calling, etc...). For testing, it may be preferable to create a schedule with the action set to **Announce then call** for the testing time period. This way, both modes of alarm announcement (over the speaker and over the telephone) may be observed. For details on how to set up a schedule, ***see***: Creating a Schedule.

In addition to creating a testing schedule, the Alarm Announcement options settings may be changed for testing. From the main menu, select **Options | Alarm Announcement** to open the **Alarm Announcement Options** window:



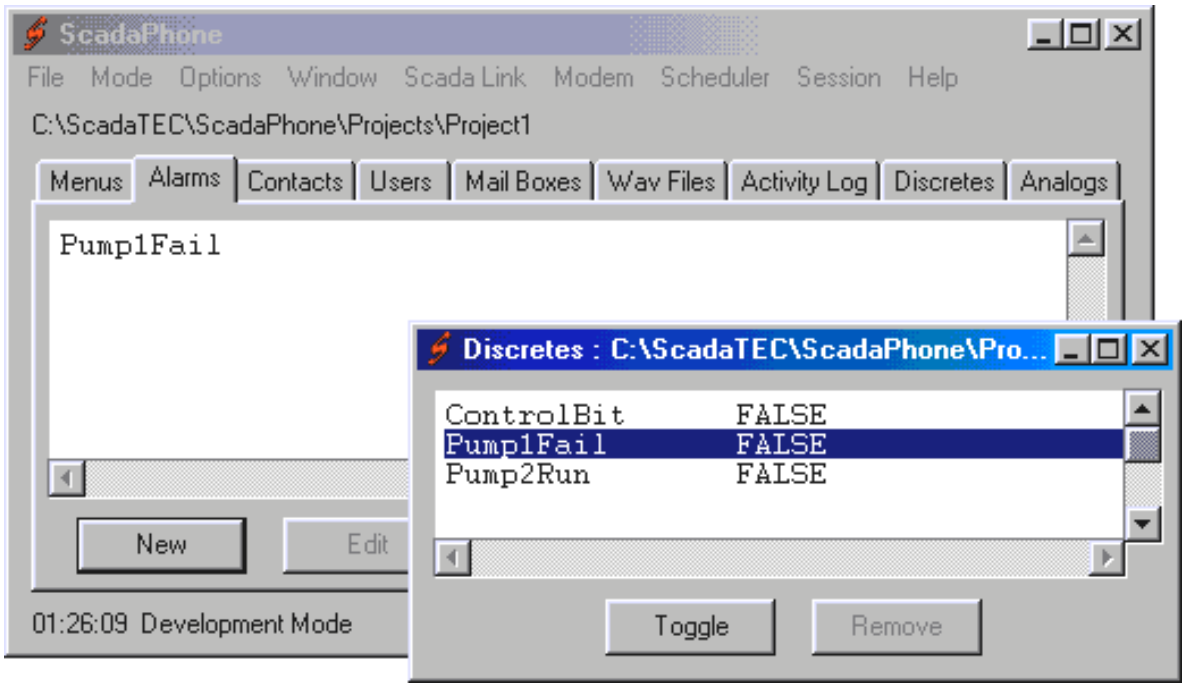
The Alarm Announcement Options window

This window contains three scroll bars that specify the following: (1) how long the alarms should be announced over the speaker before placing a telephone call, (2) how long ScadaPhone should pause between announcing alarms, and (3) how many times the alarms should be announced during each announcement. Suggested values for testing are: (1) one minute before placing a call, (2) ten seconds for pausing, and (3) play alarms two times. Click **OK** when finished.

Testing Alarm Callouts

Alarm tag values may be manually changed in order to test the callout procedure. To do this, ScadaPhone's SCADA Link should be disabled; otherwise, the alarm bits may be overwritten by values obtained from the SCADA system. To make sure that the SCADA Link is disabled, on the main menu click **Scada Link | Setup**. This will open the **SCADA Link Setup** window. Remove the check mark in the **Enabled** box. Click **OK** to close the window.

To select an alarm to test, click the **Alarms** tab in the main window. Next, from the main menu click **Window | Discrete Tags**. This will display the **Discretes** window:



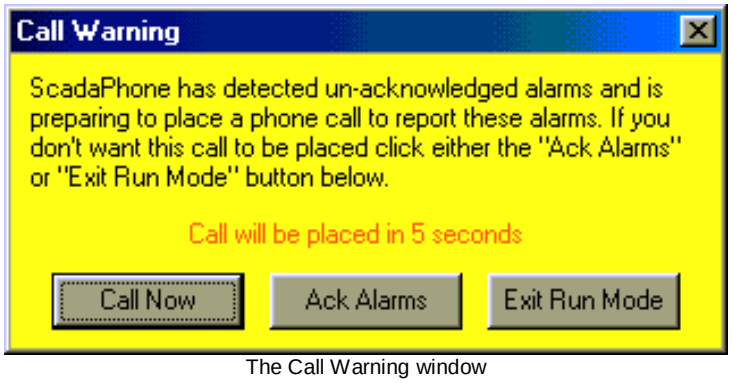
Viewing both the Alarms tab and the Discretes window

The information in this window is identical to the information on the **Discretes** tab in the main window. The **Discretes** window exists for the convenience of being able to see and manipulate the discrete tag values while simultaneously viewing a different tab in the main window.

Toggling a discrete tag value from FALSE to TRUE will trigger any alarm polling this tag. (However, if the alarm option was set to **Negative Logic**, toggling a discrete tag value from TRUE to FALSE will trigger the alarm. To review an alarm's settings, select the alarm and click the **Edit** button. This will open the Alarm Information window.) To manually change the status of a discrete tag, select a discrete tag name and click the **Toggle** button. If the **Signal Filtering** (in the **Alarm Information** window) for the alarm was set to a value greater than 0, the alarm will display a countdown showing how much time remains before the alarm is triggered. When the countdown reaches 00:00:00, the alarm line in the Alarms tab will turn yellow.

As soon as the alarm line turns yellow, the voice message defined in the **Alarm Information** window should play. If the Alarm Announcement Options were set as suggested above, this message will be played twice and then there will be 10 seconds of silence before the next iteration. This cycle will repeat for one minute and then it will be time for ScadaPhone to make a telephone call.

ScadaPhone will issue a warning for ten seconds before making a telephone call, just in case someone is at the console and doesn't want the call to be placed. The warning is displayed via the **Call Warning** window:



The Call Warning window

There are two ways to prevent a callout from proceeding: acknowledge the alarms: by clicking the **Ack Alarms** button or by clicking the **Exit Run Mode** button.

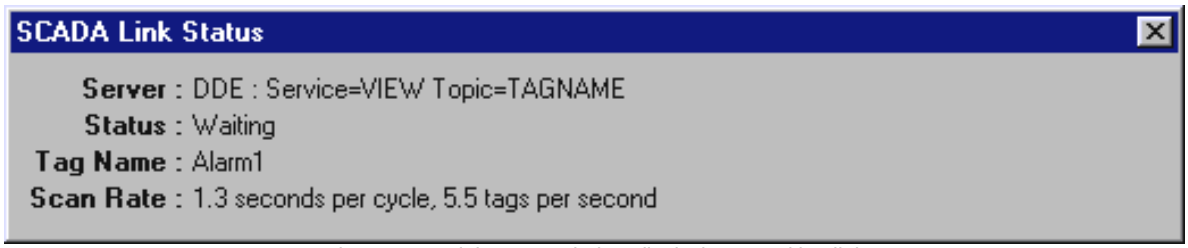
When testing, rather than waiting for the timer to count down, click the **Call Now** button. When the **Call Warning** window disappears, the modem will dial the telephone number of the next available contact (as determined by the contact availability scheduler). After the dialing has stopped, the modem goes into answer detection mode and waits for one of the current contact's answer detection scripts to be satisfied. (On an external modem, the receive data light (RD) will turn on.) If an answer detection script is satisfied, the appropriate action will be performed. If not, ScadaPhone will either try to call again (depending on the Call Persistence setting in the Alarm Contact window) or will call the next contact.

The action taken by ScadaPhone is determined by the answer detection script for that alarm. (***See***: Creating and Editing Answer Detection Scripts.) If the detected script's action was either PlayAlarms or Pager String, ScadaPhone will either play the alarm messages or send the pager string, hang up the phone, and switch to awaiting acknowledgement mode. Calls performing either of these two actions are not interactive calls (i.e. the contact was not given the opportunity to access the AlarmMenu and to acknowledge the alarms that were reported). Non-interactive calls require the person contacted to either call ScadaPhone to acknowledge the alarms over the phone or to travel to the SCADA system and acknowledge the alarms from the computer console.

If the detected script's action was either PlayAlarmsAndMenu or PlayMenu, ScadaPhone will interact with the person via the menu system until the person hangs up the phone. Upon completion of the call, ScadaPhone will return to its Run Mode: Idle state. However, if the contacted person failed to acknowledge the alarms that were reported, the next scan through the alarm list will trigger another callout.

In some cases, if answer detection script audio events are not being detected correctly, it may be necessary to tweak the parameters of ScadaPhone's Audio Analyzer. For example, if the facility housing the SCADA system has telephone lines with poor signal quality, Tone events may be mistaken for Voice. Additionally, if the person answering the call has a smooth voice, some Voice signals may be detected as Tone. If the answer detection scripts are not performing well on your phone system, refer to The Audio Analyzer

After testing alarm callouts manually, the SCADA Link should be enabled and the status checked to verify it is working correctly. First, start the SCADA system. Next, click **Scada Link | Setup** from the main menu. (For details on setting up the SCADA link, ***see***: The SCADA Link Interface.) Put a check mark in the **Enabled** check box on the **Scada Link Setup** window and click the **OK** button. ScadaPhone will now attempt to poll the SCADA software for tag values. To verify that the conversation is working correctly, click **Scada Link | Status** to open the **SCADA Link Status** window:



The SCADA Link Status window displaying a working link

In the image above, a snapshot of successful communications is shown. The **SCADA Link Status** window will also report a SCADA Link failure and inactivity via the status line. When a link is working, the tag names referenced in the active project will cycle to the right of the **Tag Name** label.

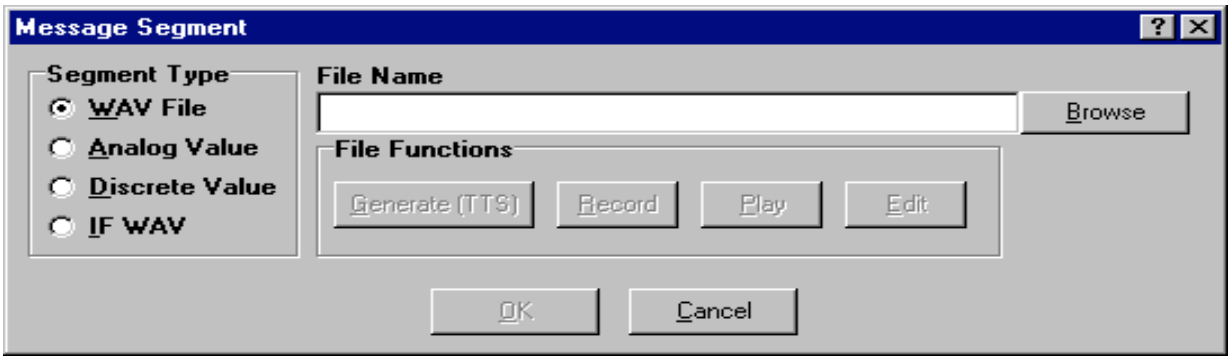
The Message Segment Window

Creating Message Segments

There are four types of message segments:

1. WAV File: Any recorded message.
2. Analog Value: Enunciates the current value of an analog tag from the SCADA system.
3. Discrete Value: Enunciates the current value of a discrete tag from the SCADA system.
4. IF WAV: Conditionally selects WAV files.

To create message segments, click the **Add** button in the **Voice Message Composition** box of the **Alarm Information** window or the **Menu Item** window. This will open the **Message Segment** window.



The Message Segment window

There are four options in the **Segment Type** panel, covered in detail below:

- WAV file
- Analog Value
- Discrete Value
- IF WAV

When the WAV file option is selected, the **Message Segment** box will include a **File Functions** box. When the Analog Value is selected, the **File Functions** box is replaced by the **Analog Formats** box. When the Discrete Value is selected, the **File Functions** box is replaced by the **Discrete Formats** box. When IF WAV is selected, the **File Functions** box is replaced by the **Conditional Expression** box.

Defining WAV Message Segments

To use an existing WAV file message segment:

- Ÿ In the **Message Segment** window, click the **Browse** button. This will open the **Select WAV file** window.
- Ÿ Click on the name of the WAV file to be added
- Ÿ Click on the **OK** button.
- Ÿ Click the **OK** button in the **Message Segment** window to return to the **Alarm Information** window or the **Menu Item** window. The name of the message segment will be entered into the **Voice Message Composition** list.

To create a new WAV File message segment:

- Ÿ In the **Message Segment** window, click the **WAV File** option.
- Ÿ Enter the name of the WAV file in the **File Name** edit box. **Note**: Do not enter a file extension. The extension '.WAV' will be added by ScadaPhone.
- Ÿ Click **Record**. ScadaPhone will display a pop-up box with a **Stop** button. When the pop-up box indicates recording is in progress, speak the desired message segment into the microphone.
- Ÿ Click **Stop** to end the recording. This will close the pop-up recording box.
- Ÿ Click the **Play** button to listen to the message segment just recorded. If necessary, re-record a WAV segment by clicking the **Record** button again. If the WAV file already exists, a pop-up box will ask confirmation of the file overwrite.

Note: The recording and playback of sound (WAV) files may be done either through the voice modem or a PC sound card. ***See:*** Setting the COM Port from the main window

WAV files may also be edited for content or unwanted noise at the beginning and/or end of the recording may be trimmed. To edit a WAV file, select the file click the **Edit** button in the **Message Segment** window. This will open the **Edit Wav File** window. *Details*: Editing WAV Files

When the message segment is complete, click **OK** from the **Message Segment** window to return to the **Alarm Information** window or the **Menu Item** window. The name of the message segment will be entered into the **Voice Message Composition** list.

Defining Analog Value Message Segments

An analog value may be added to an alarm message. To add an Analog value message segment to the **Alarm Information** or the **Menu Item** window's **Voice Message Composition** box, click **Add**. The **Message Segment** window will open. Click the **Analog Value** option. The **File Functions** box is replaced by **Analog Formats**.

Enter the name of the analog tag to be enunciated. Use the **Browse** button to see a list of analog tag names defined on the main window's **Analog** tab.

Adjust the slider to select the number of digits to the right of the decimal point to be enunciated.

Click **OK** to return to the **Alarm Information** window or the **Menu Item** window. The name of the analog tag will be entered into the **Voice Message Composition** list.

Defining Discrete Value Message Segments

A discrete value may be added to an alarm message. To add an Discrete Value message segment to the **Alarm Information** or the **Menu Item** window's **Voice Message Composition** box, click **Add**. The **Message Segment** window will open. Click the **Discrete Value** option. The **File Functions** box is replaced by **Discrete Formats**.

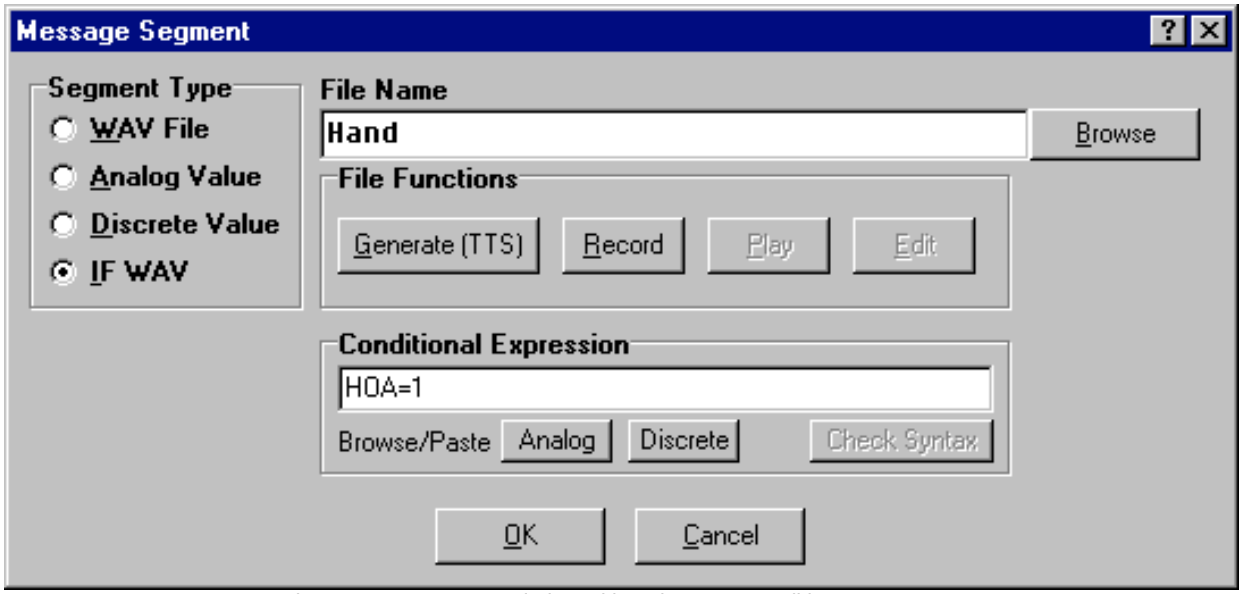
Enter the name of the discrete tag to be enunciated. Use the **Browse** button to see a list of discrete tag names defined on the main window's **Discrete** tab.

Click the appropriate option button in the **Discrete Formats** box to select the how the discrete value will be enunciated.

Click **OK** to return to the **Alarm Information** window or the **Menu Item** window. The name of the discrete tag will be entered into the **Voice Message Composition** list.

Defining IF WAV Message Segments

An existing WAV file may be conditionally added to an alarm message. To add a conditional WAV file segment to the **Alarm Information** window's **Voice Message Composition** box, click **Add**. The **Message Segment** window will open.



The Message Segment window with and IF WAV condition

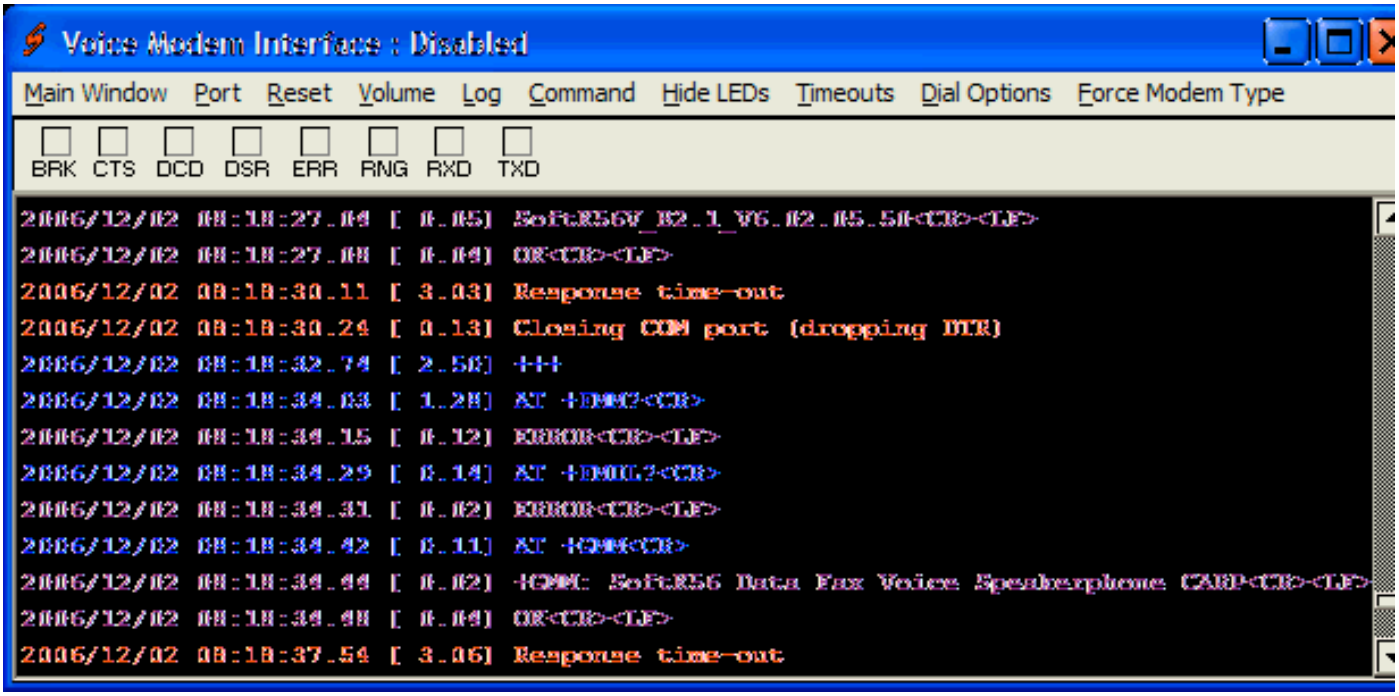
Click the **If WAV** option. Select the name of the WAV file segment to be conditionally added by clicking on the **Browse** button next to the **File Name** text box. Enter the logical conditional expression in the **Conditional Expression** text box. The text will be shown in red until a valid logical expression is entered. Analog and discrete tags may be selected by clicking on the **Analog** or **Discrete** buttons.

The selected WAV file segment will be added to the voice message only when the conditional expression is **True**.

For example, this option may be used in situations such as enunciating the position of an HOA switch in either Hand, Off, or Auto. In this example, the message segment begins by stating "The HOA switch is in". This is followed by the word "Hand" when the value of the tag named HOA=1, by the word "Off" when HOA=2, or by the word "Auto" when HOA=3.This requires three **IF WAV** segments. The "Hand" **IF WAV** segment is shown above.

The Modem Window

To open the **Modem Window**, select **Modem** from ScadaPhone's top menu:



The modem window

The modem window displays the log of voice modem communications. Each line is color coded as follows:

Blue	Commands sent to the modem
Purple	Modem responses
Black	Voice and WAV file actions
Red	Error information
Green	Diagnostic information

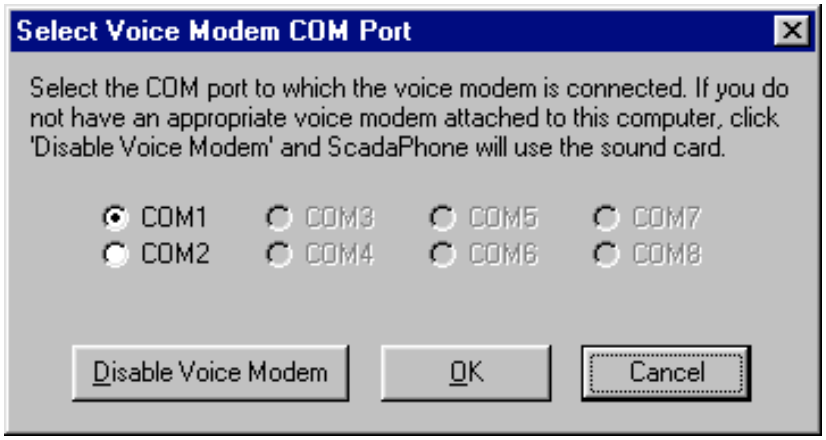
Menu Overview

Main Window

Brings up ScadaPhone's main window without closing the Modem Window.

Port

Opens the **Select Port** window which displays available COM ports:



The Select Voice Modem COM Port with COM1 selected

To use the PC sound card for the recording and playback of sound (WAV) files rather than the modem, click the **Disable Voice Modem** button.

COM ports that are not available are grayed out. To select a port, click the radio button corresponding to the COM port to which the modem is attached and click **OK**.

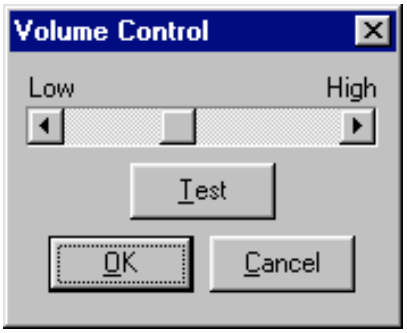
Reset

Resets the modem.

To check that the modem is connected properly, click on the **Reset** menu item. There should be some activity in the **Modem Window** log. The last line should display "<DLE>h" or "OK<CR><LF>". This indicates that the modem is ready. You should NOT get "ERROR<CR><LF>".

Volume

Opens the Volume Control window:



Move the slider to adjust the modem volume. Click the **Test** button to check the volume. Click **OK** when done.

Log | Diagnostics

When toggled on (as indicated by a checkmark) extended diagnostic data will be entered into the modem log for troubleshooting purposes. Log diagnostics will be displayed in green. The extended log diagnostics will help technical support in diagnosing problems. The log file is named ModemLog.rtf and is stored in the project folder.

Log | Snapshot

Copies the current modem log data into memory, opens Microsoft Word, and pastes the data into a new Word document. This document can be saved and e-mailed to technical support.

Log | Freeze

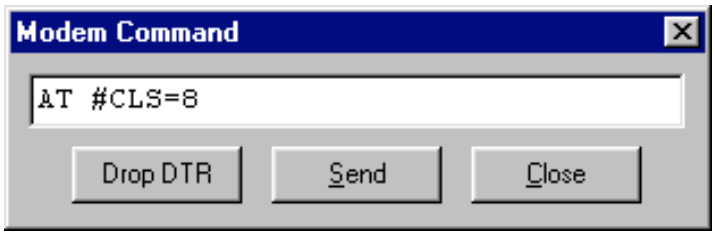
Freezes the log so that data is no longer updated.

Log | Clear

Clears the current modem log data.

Command

Opens the Modem Command window:



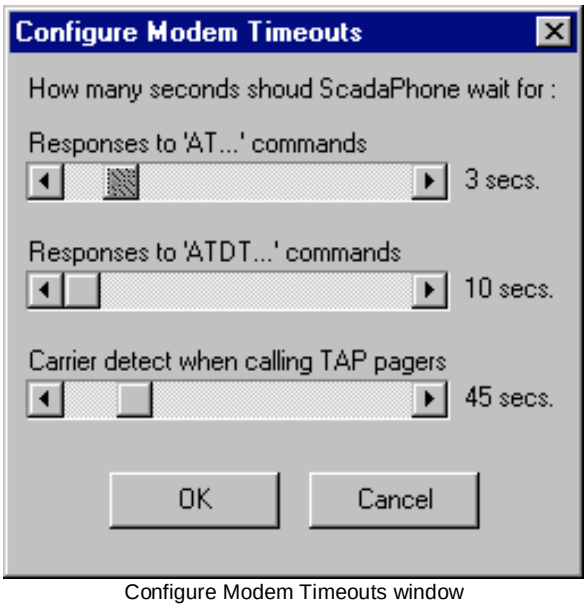
- The **Drop DTR** button causes the Data Terminal Ready (DTR) line to go low.
- Enter any special modem command into the text box and click the **Send** button to send it to the modem.
- Click **Close** when done.

Show/Hide LEDs

Displays or Hides the row of LED indicators at the top of the Modem Window.

TimeOuts

Brings up the Configure Modem Timeouts Window.



Configure Modem Timeouts window

Use the slider to set the wait times for modem response to AT commands, ATDT commands, and how long to wait for the carrier detect signal when calling TAP pagers.

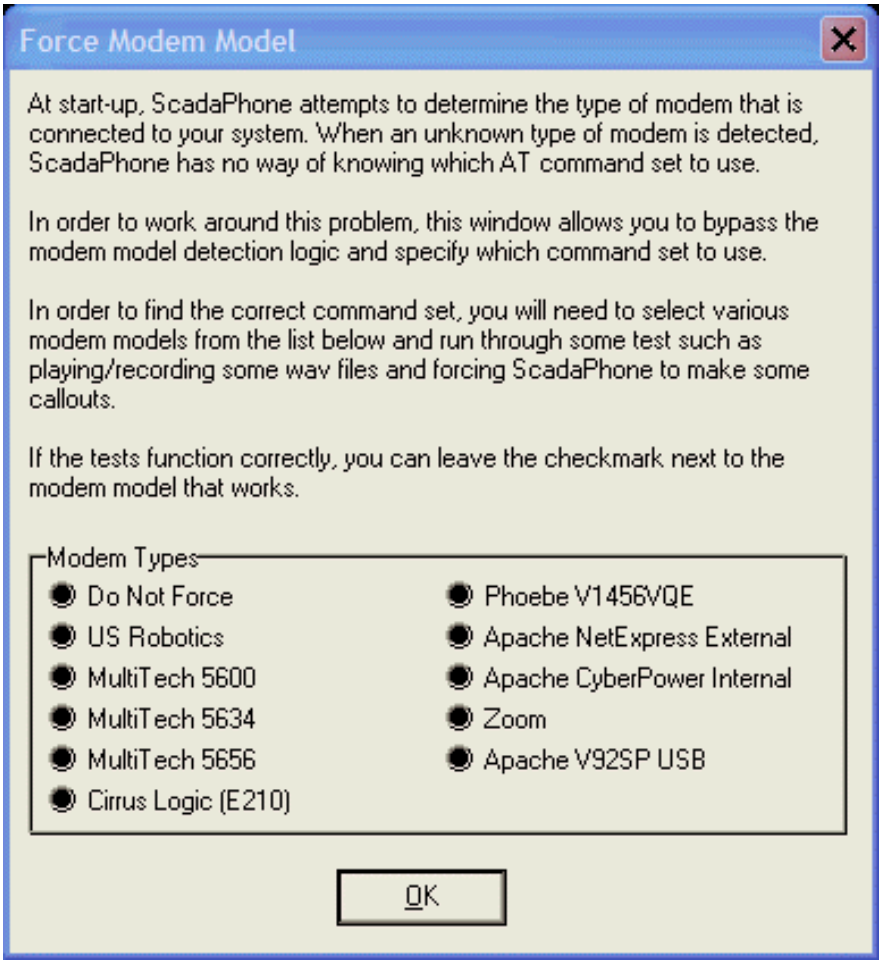
Dial Options

Brings up the Dial Options window.

Enter any additional AT commands that need to be inserted between the AT and DT modem commands. Example: "AT X0 DT555-1234"

Force Modem Type

Brings up the Force Modem Model window.

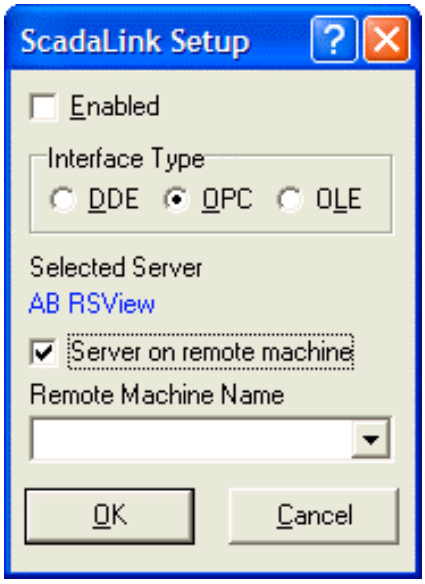


SCADA Link Interface

Setting Up the SCADA Link Interface

Before ScadaPhone can obtain data from the SCADA software system, it must know the configuration of the SCADA software's tag server interface.

There are three interface types supported by ScadaPhone: **DDE**, **OPC**, and **OLE**. To select the interface type, click **SCADA Link | Setup** from ScadaPhone's top menu. This will open the **SCADA Link Setup** window:



The **Enabled** checkbox controls the link to the SCADA system. During development, it may be preferable to disable the link by leaving the checkbox unchecked. When the SCADA link is enabled, ScadaPhone may try to start and stop the SCADA software each time the mode is switched between development and runtime. After development is completed, enable the link by checking the **Enabled** box.

Select the **Interface Type** radio button appropriate for the SCADA software.

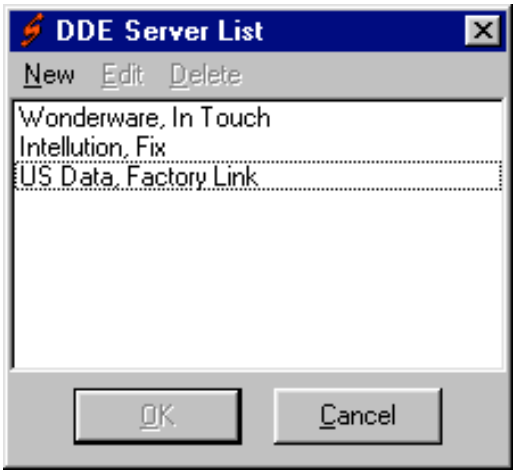
To specify the server name, click the blue text under **Selected Server** . One of three windows will open, depending upon which interface has been selected: the **DDE Server List** window, the **OPC Server List** window, or the **OLE Server List** window.

If the SCADA software (server) is running on a different PC than ScadaPhone, select the 'Server on remote machine' checkbox and enter or select the remote PC's network name in the 'Remote Machine Name' text box. The names of all the computers currently on the network will be listed in the dropdown list box.

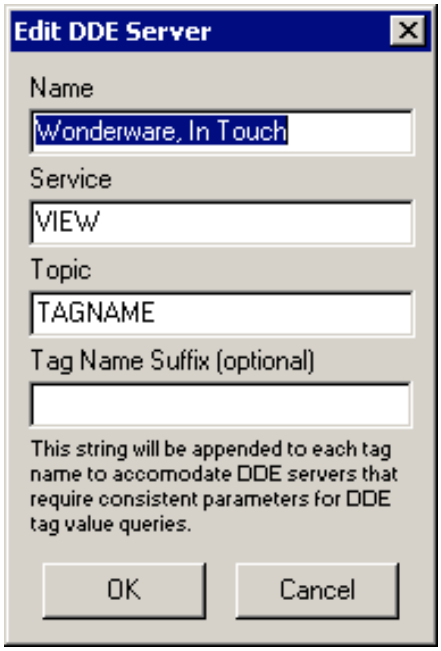
Once the SCADA Link interface is set up and the selected server properly installed, and if the SCADA software supports automatic launching, switching to run mode should cause the SCADA application to launch. If the SCADA application fails to launch, the SCADA software may need to be started manually.

To avoid spurious alarms, whenever the SCADA software is shut down, ScadaPhone should be shut down first, then the SCADA software system.

The DDE Server List Window



By default, a few popular SCADA servers are pre-defined in the DDE Server List window. To configure DDE servers not found in the default list, click **New** from the top menu. To see and/or to modify an existing server definition, highlight the server definition name and click **Edit** from the top menu. Both **New** and **Edit** will open the **Edit DDE Server** window.



The Edit DDE Server window when Wonderware Interface is selected

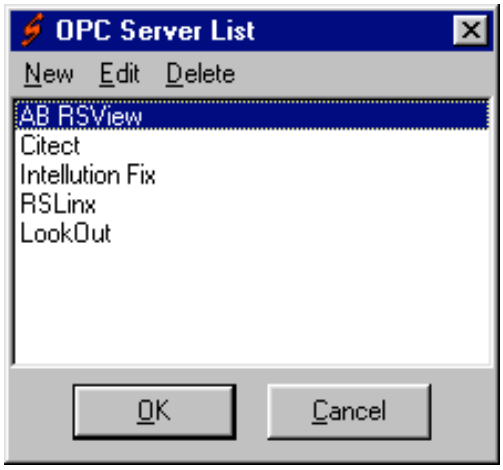
The **Name** field lists the name of the server (which will be shown in the **DDE Server List** window). The **Service** field is the name of the program providing the data. The **Topic** field is the document name or topic within that program. (Consult your SCADA software's manual to determine what these values should be).

The optional **Tag Name Suffix** can be specified if all of the tag names that are to be obtained from the SCADA software have repetitious suffixes. This way, the tag names that appear in ScadaPhone do not need to include this suffix and clutter the appearance.

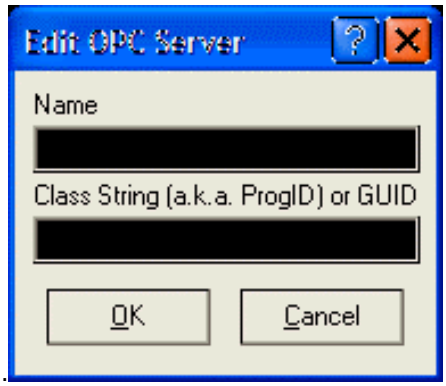
When all values have been entered, click **OK** to return to the **DDE Server List** window.

To configure DDE servers not found in the default list, click **New** from the top menu of the **DDE Server List** window. The window will display blank edit boxes which may be used to custom configure DDE servers. Consult your SCADA software's manual to determine what these values should be.

The OPC Server List Window



A few SCADA servers are pre-defined in the OPC Server List window. To configure OPC servers not found in the default list, click **New** from the top menu. To see and/or to modify an existing server definition, highlight the server definition name and click **Edit** from the top menu. Both **New** and **Edit** will open the **Edit OPC Server** window:



Consult the SCADA software's documentation to obtain the **Name** and **Service** for any OPC servers not in the default list.

GUIDs can be used in place of class strings when setting up OPC server connections. For example, instead of specifying TCPTagServer.OPCServer.1 as the server class string you can specify {C05157E0-B5E2-4D66-94C7-3C3283413DE2}.

When the values have been entered, click **OK** to return to the **OPC Server List window.** Click **OK** again to return to the ScadaPhone main screen.

Note: The list of OPC item handles is dumped to a text file named OPCItemHandles.txt each time an OPC connection is initialized.

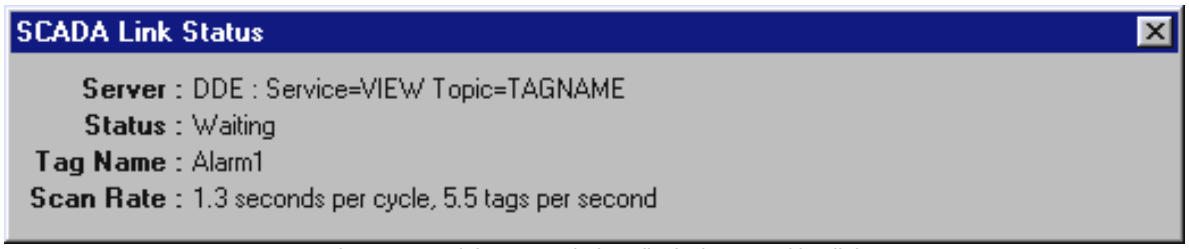
The OLE Server List Window

Because there is no standard for non-OPC OLE interfaces, selecting an OLE server is much more restrictive than DDE or OPC. Click on one of the option buttons to select one of the pre-defined OLE interfaces. Any additional OLE interfaces will have to be implemented by ScadaTEC's programming staff.

Click **OK** to return to the ScadaPhone main screen.

Checking the SCADA Link

Once the SCADA Link is set up, it should be enabled and the status checked to verify it is working correctly. First, start the SCADA system. Next, click **Scada Link | Setup** from ScadaPhone's top menu. This will open the **SCADA Link Setup** window. Put a check mark in the **Enabled** check box and click the **OK** button. ScadaPhone will now attempt to poll the SCADA software for tag values. To verify that the conversation is working correctly, click **Scada Link | Status** to open the **SCADA Link Status** window:

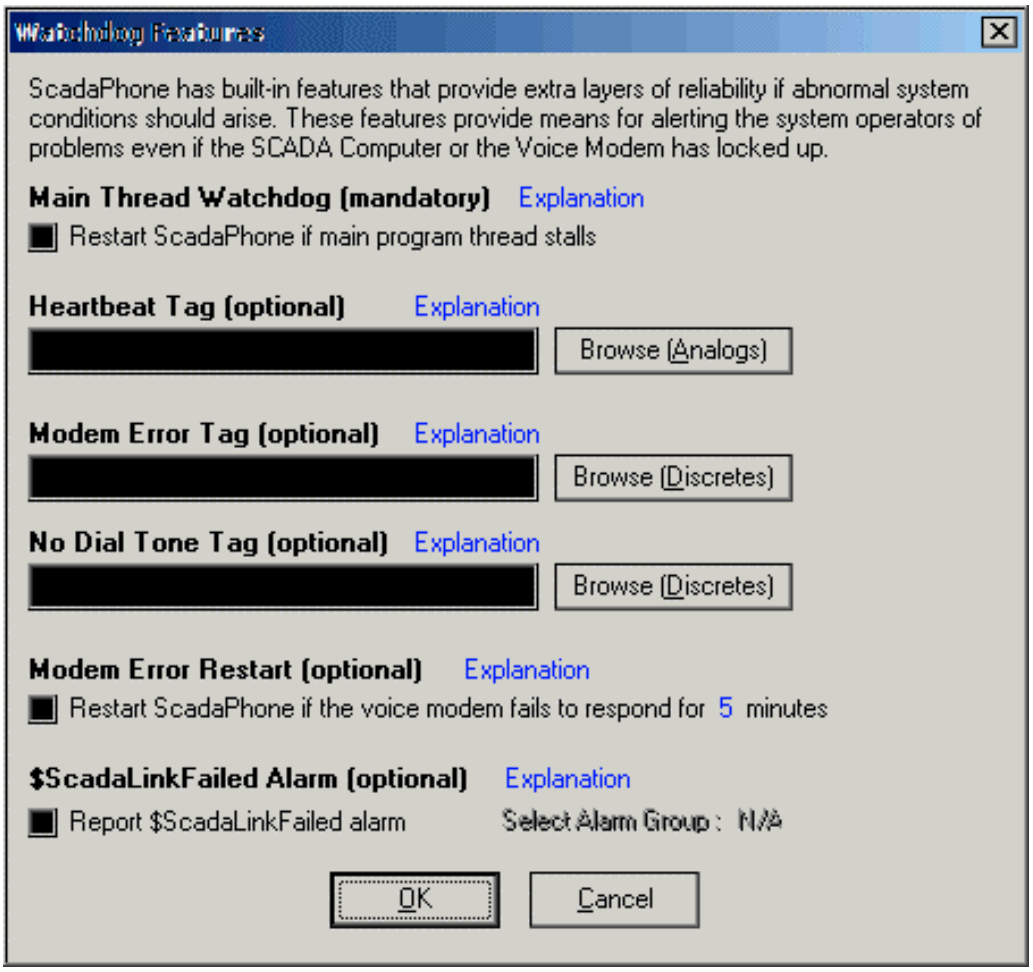


The SCADA Link Status window displaying a working link

In the image above, a snapshot of successful communications is shown. The **SCADA Link Status** window will also report a SCADA Link failure and inactivity via the status line. When a link is working, the tag names referenced in the active project will cycle to the right of the **Tag Name** label.

Watchdog Features

All of the "watchdog" features are consolidated into the Watchdog Features window (Opeions | Watchdog Features). All of the features have been documented in separate explanation windows which can be viewed by clicking on the Explanation labels in the Watchdog Features window.



Main Thread Watchdog

ScadaPhone uses several different "process threads" to perform the various tasks necessary to function as a Windows application. The main thread is responsible for handling all of the operator input and time driven logic within ScadaPhone. In rare and abnormal situations, this thread may "hang" or "lock up" (usually due to operating system events caused by other applications or hardware).

As a mission critical 24 hour per day application, ScadaPhone has a built in safeguard to detect these abnormal events and correct them if possible. This is accomplished by the Main Thread Watchdog; this watchdog is a very simple process thread that does nothing but monitor the function of the main process thread; if and when there is a problem with the main execution thread, the watchdog launches a separate application named RestartScadaPhone.exe.

RestartScadaPhone will attempt to close ScadaPhone gracefully at first and then result to brute force if necessary. After ScadaPhone has been successfully closed, RestartScadaPhone will launch ScadaPhone so that normal operation can resume. This safeguard is completely automatic and no user intervention is required.

Heartbeat Tag

If an analog ScadaLink tag is specified to be the HeartbeatTag, ScadaPhone will write the current minute from the real time clock (0..59) to the selected SCADA/PLC tag once per minuite. Logic in

the SCADA/PLC can monitor this tag and assert an output to a backup hardware dialer in the event that the HeartbeatTag fails to change within a configured amount of time (e.g. 5 mins). You can see evidence of the heartbeat tag in the Activity Log via the repetitive "SCADA system accepted new tag value..." messages logged every time a write is issued. Also note that this feature only works in Run Mode; thus, it also serves as a "the operator left it in Development Mode" watchdog.

For example, logic can be inserted into either the SCADA or the PLC to energize an output whenever the value of the Heartbeat Tag fails to change over a 5 minute interval; the backup hardware dialer can be programmed to issue a brief message such as "ScadaPhone alarm dialer is not active" whenever the PLC output is energized.

This feature not only provides protection against failures on the SCADA computer, it also catches operator errors such as inadvertently leaving ScadaPhone in Development Mode after making modifications to the project.

Modem Error Tag

In the event that the voice modem should fail to respond to ScadaPhone's commands, a bit can be turned on in the SCADA system. This bit can be used to trigger a secondary hardware alarm dialer or to cycle the power to the modem via a "reset cable" controlled by the PLC.

To use this optional safeguard, specify the name of the discrete tag you wish ScadaPhone to use as a modem failure signal. Whenever the modem is operating normally, this bit will be set to logical zero (FALSE); if the modem fails to respond to ScadaPhone's AT commands, ScadaPhone will write a logical one (TRUE) to this bit. The Modem Error Bit will be returned to zero as soon as a valid response is received from the modem.

When using this feature, it is advisable to apply some filtering to any SCADA/PLC logic that is associated with this bit; for example the logic should wait for the Modem Error Bit to be TRUE for 30 seconds or more before taking action. Otherwise, brief modem communication problems may produce annoying false alarms.

No Dial Tone Tag

The Modem Error Tag option handles situations where the voice modem stops responding to ScadaPhone's commands; however, in situations where the phone line is dead, the modem will issue repetitive "NO DIALTONE" result codes.

This scenario fails to activate the Modem Error Tag because the Modem Error Tag is reset every time a valid response is received from the modem. The No Dial Tone Tag covers instances where the modem is functioning properly but the phone line is not.

The No Dial Tone Tag will be set to a logical one (TRUE) whenever 3 attempts to call out are aborted due to the modem returning "NO DIALTONE". The bit will be reset to a logical zero (FALSE) as soon as the modem responds to the AT DT command with a valid result code (i.e. "OK", "CONNECT", or "VCON").

To use this optional safeguard, specify the name of the discrete tag you wish ScadaPhone to use as a dial tone failure signal. This bit can be mapped to a PLC output to trigger some other means of notifying the operators of a phone line failure (e.g. back up hardware dialer, strobe, etc...) .

Modem Error Restart

On some systems, it has been observed that the voice modem can become unresponsive due to problems with either the COM port hardware or the COM port driver. ScadaPhone tries to overcome these problems by closing and reopening the COM port; however, in some cases, it becomes necessary to shut down and restart ScadaPhone.

ScadaPhone has the ability to automatically respond to this failure scenario without any operator intervention. If the "Restart ScadaPhone if the voice modem fails..." check box is selected, this watchdog will be activated. If and when the voice modem becomes unresponsive for the configured amount of time, ScadaPhone will launch RestartScadaPhone.exe.

This feature can be used in conjunction with the Modem Error Tag; however, it is advisable to extend the modem failure restart interval in order to allow the functions associated with the Modem Error Tag enough time to operate.

$ScadaLinkFailed Alarm

In every ScadaPhone project, a discrete system tag named $ScadaLinkFailed is automatically defined. This tag reflects the current status of the OPC/OLE connection between ScadaPhone and the SCADA server being polled by ScadaPhone.

If ScadaPhone polls the entire list of tags that are needed from the SCADA server and fails to receive at least one valid response, the $ScadaLinkFailed bit is set to a logical one (TRUE). As soon as a valid polling response is received the $ScadaLinkFailed bit is reset to logical zero (FALSE).

The status of this bit can be used to drive a predefined system alarm (also named $ScadaLinkFailed). Clicking the checkbox on the Watchdog Features window will automatically create and/or enable this alarm. With this alarm activated, ScadaLink failures can be announced via any of the standard ScadaPhone methods (voice, email, pager, etc...)

Once created, this alarm can be modified just like any other alarm; the most common modification would be to change the Alarm Group field so that an appropriate contact is alerted if and when this alarm triggers.

Advanced_Features

The Audio Analyzer

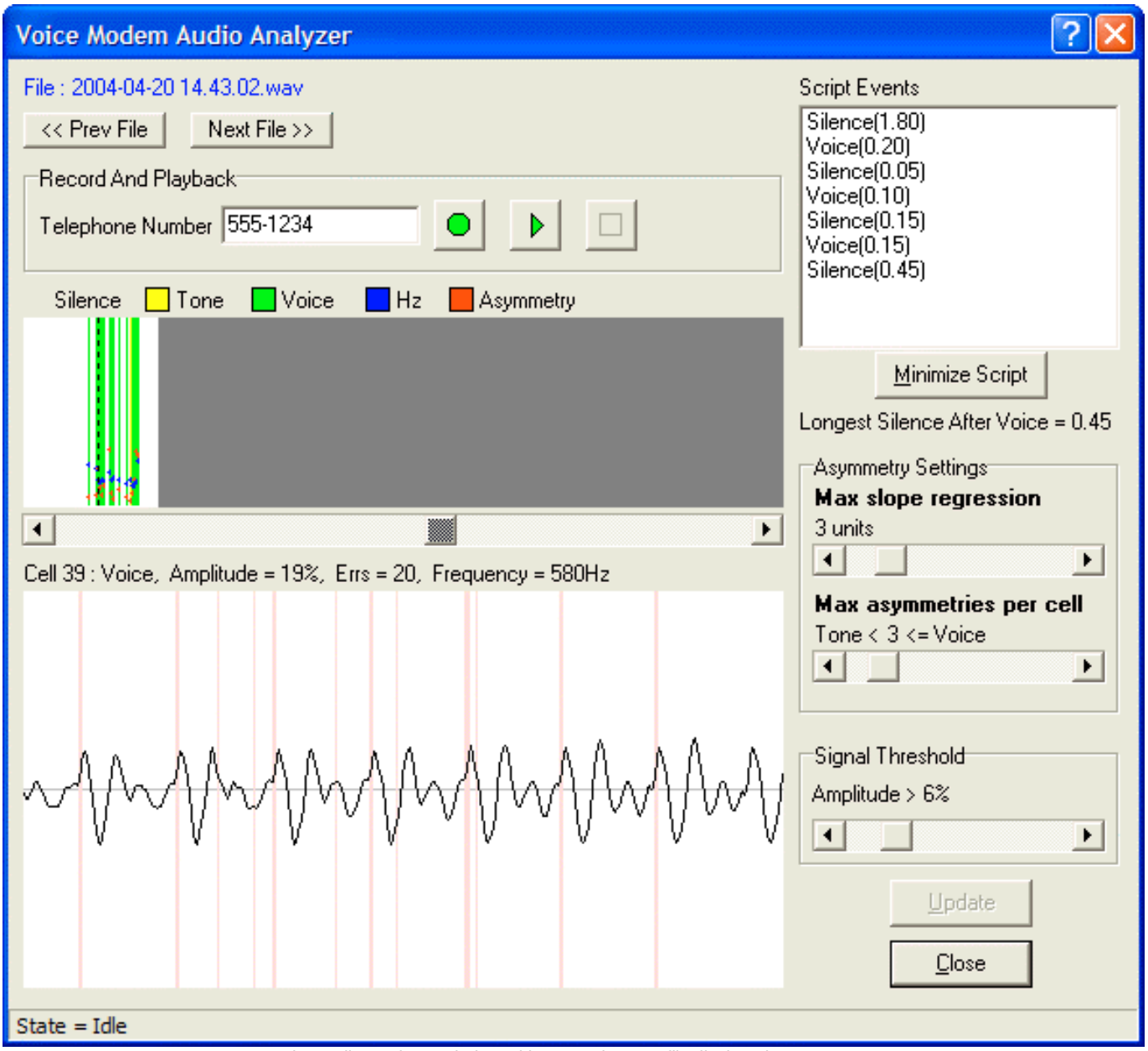
The Audio Analyzer window may be opened from ScadaPhone by selecting **Window | Audio Analyzer** on the main screen's top menu. ScadaPhone utilizes an audio signal analyzer to detect when a contact, whether a person or a beep, has answered the telephone during a callout. The Audio Analyzer may be used to help correct an answer detection script that is not working properly.

The Audio Analyzer becomes active after a callout has been placed and the voice modem is in record mode. As the digitized audio signal from the telephone line streams in, ScadaPhone categorizes 50 millisecond samples of the data into one of three categories: **Silence**, **Voice**, and **Tone**.

The Audio Analyzer comes pre-configured with values that specify the thresholds for categorizing these signal states; however, in some instances it may be necessary to tweak these parameters for more accurate signal detection. The most common problem that can arise is when the voice modem is connected to a telephone line that has poor signal quality, which could cause ScadaPhone to categorize **Tone** signals as **Voice** signals. If this happens, ScadaPhone may deem the ring-back (the tone generated by the phone company to indicate that the telephone being called is ringing) to be voice. If the **Answer Detection Script** for the current contact is **Voice(0.10)+Silence(0.50) = PlayAlarmsAndMenu(MainMenu)**, ScadaPhone will start playing the alarms after the first ring-back. If the person being called picks up the phone on the third ring, ScadaPhone will already have been talking for 10 seconds or more.

When ScadaPhone makes a callout, the results of the Audio Analyzer's recording are stored in a time-stamped file with the extension **.WAV** in the project directory. ScadaPhone automatically deletes old Audio Analyzer files, but keeps up to ten on disk. If there are problems with any answer detection scripts, any of the latest ten files may be opened and the data examined for errant calls.

When the Audio Analyzer is opened (from the main window, select **Window | Audio Analyzer**), it automatically loads the most recent file.



The Audio Analyzer window with a sample WAV file displayed

To examine a different file, click the 'Prev File' or 'Next File' buttons or 'click the blue file name link at the top of the window. ScadaPhone opens the AudioAnalyzer folder, where the .WAV files are stored in the format `year-month-day hours.minutes.seconds.` Select the desired file name and click the **Open** button.

The data is displayed graphically in two boxes. The top box, the **Signal State Graph**, displays the signal states 50 milliseconds per pixel. As the color swatches indicate, a vertical white line represents a **silence** sample, a green line represents a **voice** sample, and a yellow line represents a **tone** sample. The scroll bar beneath the signal state graph moves the vertical selection line, which allows individual cells to be selected and displayed in the lower **Cell Graph** box. The selection line may also be moved by clicking on the graphic data display. The above example is a voice cell.

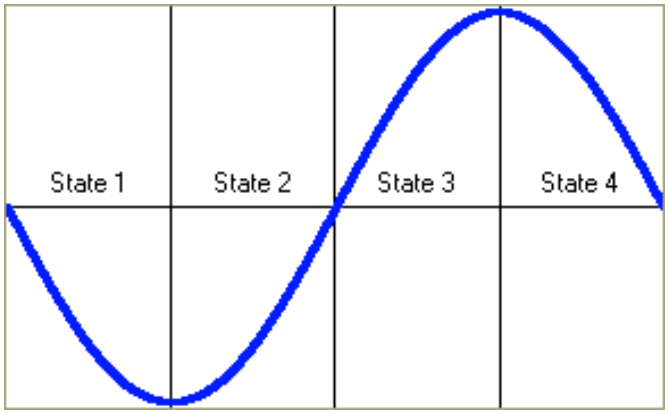
The **Script Events** box to the right of the **Signal State Graph** may be used to analyze the sequence of

events. The **Script Events** list displays the signal states recorded in the Audio Analyzer file in the same format that ScadaPhone uses for its Answer Detection Scripts. This list may be used when the length of silence within recorded voice mail WAV files needs to be determined in order to create multiple scripts.

Note that there are usually numerous repetitions in the **Script Events** list. When ScadaPhone is comparing this list to Answer Detection Scripts, the list is continuously being minimized to remove redundancies. To see what the minimized list looks like, click the **Minimize Script** button.

The lower **Cell Graph** box graphs the signal amplitude for the 360 samples in the 50 millisecond cell. Light red lines are drawn to indicate points where the audio signal deviates from a smooth sine wave (**asymmetries**). A clean tone usually has no asymmetries.

The red marks in the Audio Analyzer's **Cell Graph** indicate **signal asymmetries**. To illustrate exactly what constitutes an **asymmetry**, examine the sine wave graph. In this figure, a sine wave has been divided into four sections indicating signal states:



1. Negative and descending. As this state progresses, the slope of the graph should continuously approach zero.
2. Negative and ascending. As this state progresses, the slope of the graph should continuously steepen (positively).
3. Positive and ascending. As this state progresses, the slope of the graph should continuously approach zero.
4. Positive and descending. As this state progresses, the slope of the graph should continuously steepen (negatively).

Conceptually, a signal **asymmetry** occurs when the signal disobeys the rules stated above. In actuality, these rules are too strict for the digitized audio coming from the telephone line. Due to signal noise and analog to digital round off error, the slope of a **tone** signal may deviate slightly from one sample to the next.

For example: assume that the modem is digitizing a tone, the current sample is deemed to be in state 2, and that the slope from the pervious sample to the current sample is 10 units. If the next sample is also in state 2 (negative and ascending), but its digitized value is only 9 units higher than the previous sample, the slope has regressed by one unit (the rule for state 2 is that the slope should be continuously increasing). If the rules are strictly applied, a signal asymmetry would be flagged at this sample. However, ScadaPhone's Audio Analyzer allows a **Maximum Slope Regression** threshold to be specified, in order to accommodate telephone lines with less than perfect signal quality (i.e. all of them).

The **Maximum Slope Regression** can be adjusted via the scroll bar in the **Asymmetry Settings** section of the Audio Analyzer window. Setting this value to zero means that the Audio Analyzer will be very

critical of the audio signal thus producing more asymmetries per cell; setting this value higher causes the Audio Analyzer to be more forgiving of signal quality. Be careful, setting the **Maximum Slope Regression** too high may result in some **voice** signals being interpreted as **tone**.

The **Maximum Asymmetries Per Cell** scroll bar works in conjunction with the **Maximum Slope Regression** scroll bar in differentiating between **voice** and **tone** signals. As the label above the scroll bar indicates, cells with fewer asymmetries than this threshold are deemed to be **tone** and cells with more asymmetries are deemed to be **voice**.

The **Signal Threshold** scroll bar is used to specify the threshold between **silence** and **signal** (signal being either **voice** or **tone**). If this threshold is set too high, some **tone** and **voice** events will not be recognized because they will be deemed **silence**. If this threshold is set to low, extraneous cells containing short bursts of noise may be misinterpreted as valid signals.

Due to the considerable processing time, the graphs are not updated immediately as these three scroll bars are moved. After changing the scroll bars, click the **Update** button to see what effect the changes make on the signal graphs.

The **Record And Playback** controls allow you to watch the Audio Analyzer in action. Note that the buttons in this box resemble the buttons on a tape or CD player. They are as follows:

Record 

Play 

Stop 

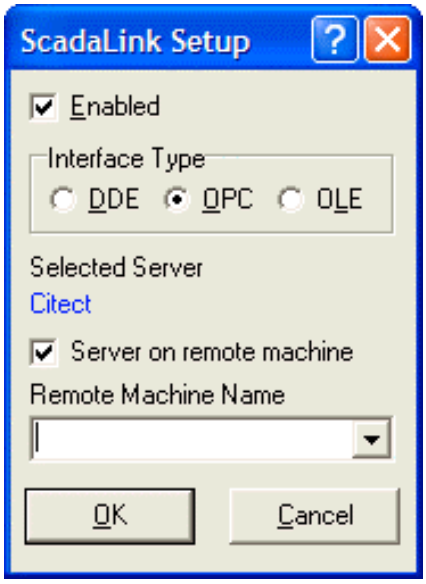
To record an Audio Analyzer file, enter the desired telephone number and press the **record** button. The modem will dial the number and the call will be heard while in progress. As time elapses, the **Signal State Graph** will track from right to left showing its perception of the audio stream coming from the modem. To hang up, click the **Stop** button. To hear what was just recorded, click the **Play** button. To listen to a previously recorded Audio Analyzer file, click the **File** option on the top menu and select one from the list.

Citect Interface

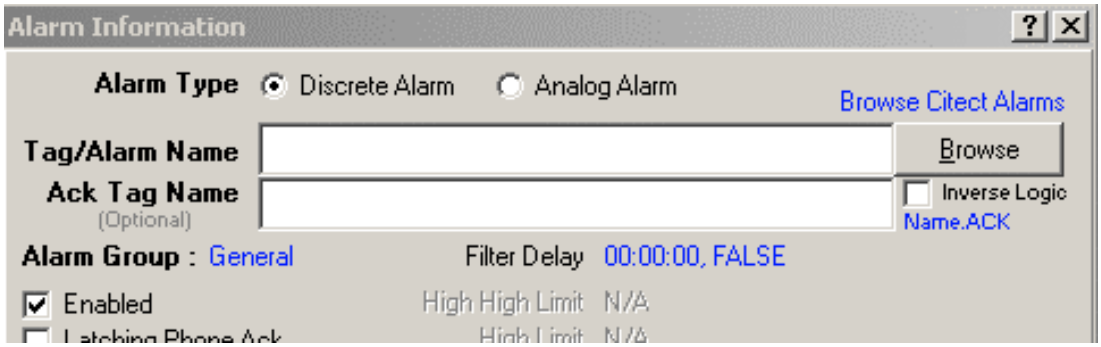
This is a feature of ScadaPhone that allows the users of the CitectSCADA software to display and selectively import tags that are defined in the CitectSCADA software. The alarm tag types that may be imported are: Digital, Analog, Advanced, Time Stamped, and Multi Digital. General tag types that may be imported are: Analog, Digital, and String.

Importing Citect Alarm Tags

If Citect has been selected in the SCADA Link Setup window,



then when you add or edit an alarm tag a new link, 'Browse Citect Alarms' , is added to the upper right of the Alarm Information window as shown.



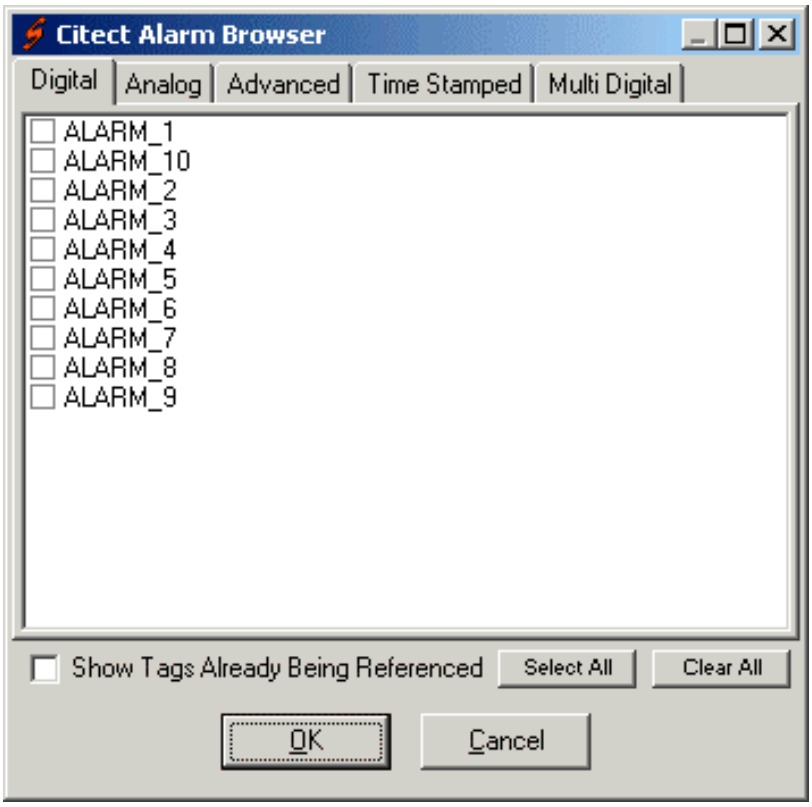
For this link to work the CitectSCADA software must be running the desired project on the same PC. This is necessary to allow the tag information to be imported. For general information on alarm tags please see the topic Creating Alarm Tags and Messages.

Note1: When importing an analog alarm from the CitectSCADA software seven new alarms are created in ScadaPhone. These are: .DeviationHighAlarm, .DeviationLowAlarm, .HIghAlarm, .HighHighAlarm, .LowAlarm, .LowLowAlarm, and .RateOfChangeAlarm. There is also one analog tag generated, .State, and eight discrete tags: .DeviationHighAlarm, .DeviationLowAlarm, .HIghAlarm, .HighHighAlarm, .LowAlarm, .LowLowAlarm, .RateOfChangeAlarm and .Ack. When an alarm is deleted, all tags associated with the deleted alarm that are not referenced elsewhere in ScadaPhone are removed.

Note2: If ScadaPhone encounters a tag name that is not valid in ScadaPhone during import or entered manually it will create a valid alias for use within ScadaPhone by placing an underscore in front of the tag name (/tag1 becomes _/tag1). The alias will be used within ScadaPhone but the original tag name will be used when communicating with the SCADA software.

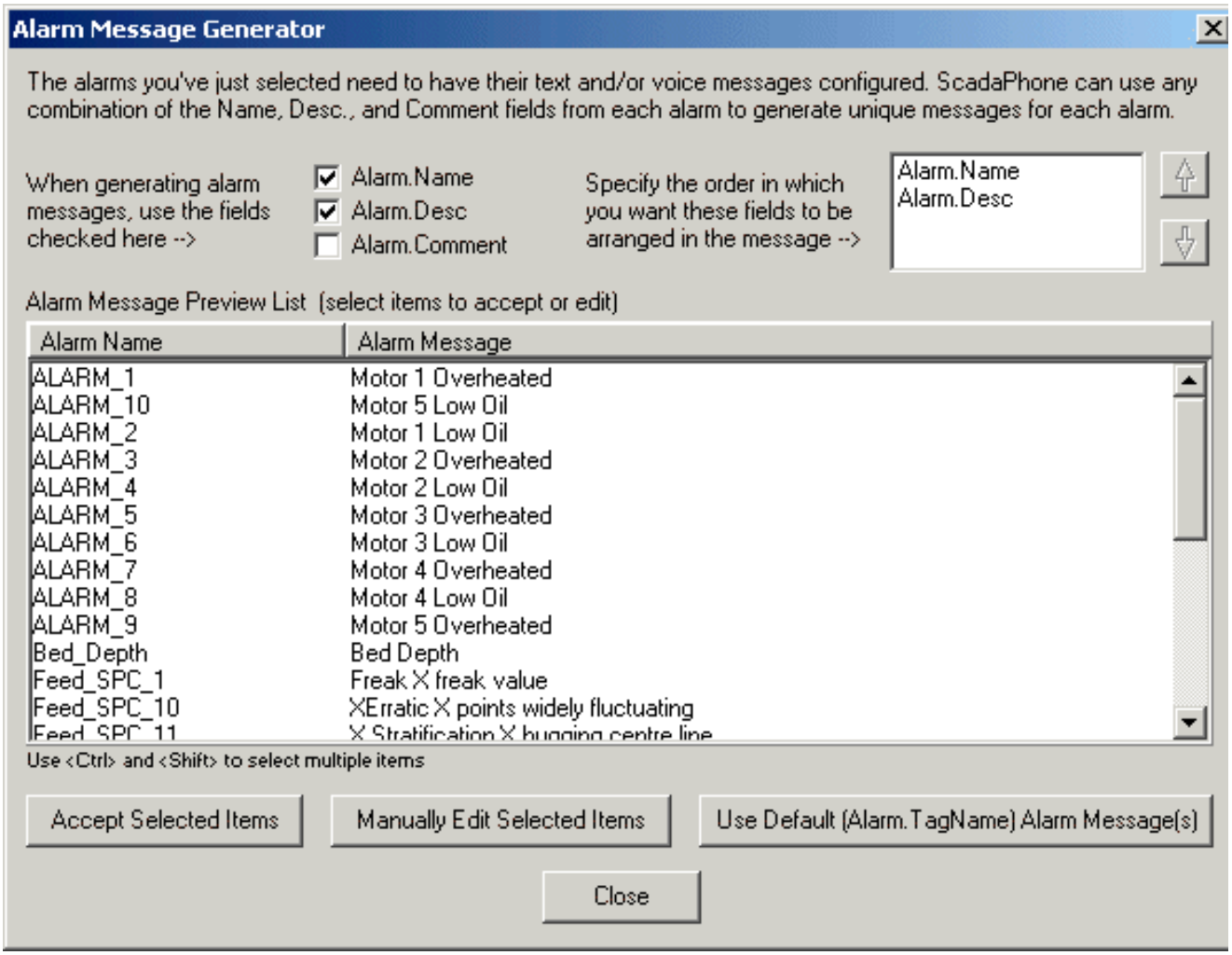
Clicking on the blue 'Browse Citect Alarms' link will display the following dialog.

Citect Alarm Browser Dialog



This dialog allows the selection of sum or all the alarm tags currently defined in the CitectSCADA software project. Each tab displays tags of the different types. As tags are selected and imported into ScadaPhone they are excluded from the lists. To display tags that are already referenced on ScadaPhone, check the 'Show Tags Already Being Referenced' checkbox. After all the desired tags are selected, click the 'OK' button. The Alarm Message Generator dialog will be displayed.

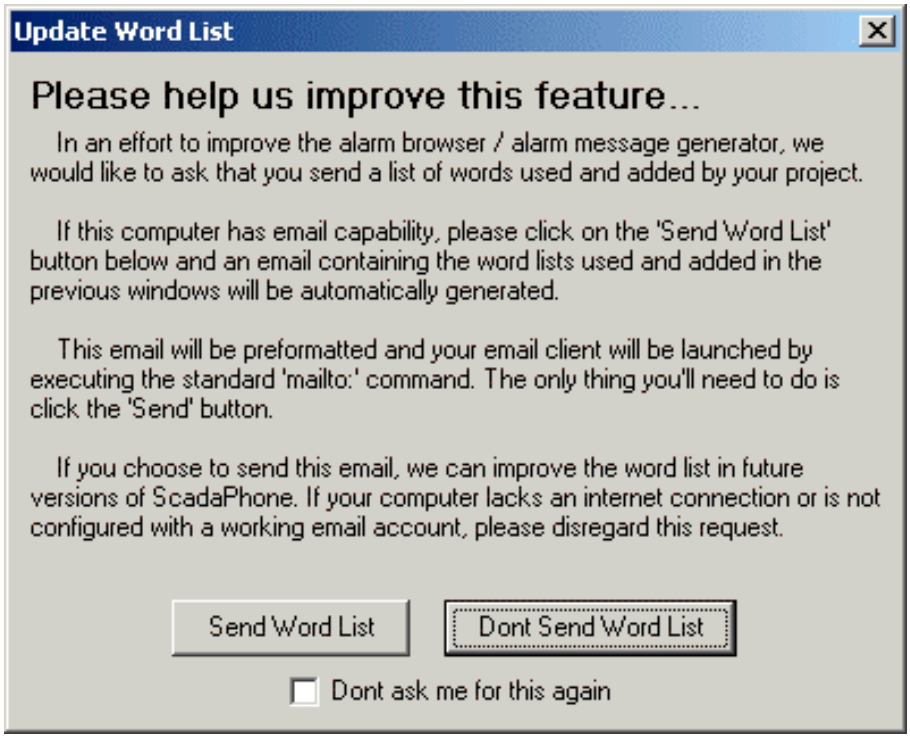
Alarm Message Generator dialog



The purpose of this dialog is to allow the configuration of the text and/or voice messages for the alarms. The alarm message is shown in the 'Alarm Message' column. The composition of the alarm messages is controlled by selecting or de-selecting the **check boxes**. The order of the selected fields may be changed by selecting the field and clicking on the up/down arrows in the text box.

Note: The composition of the alarm message is very important if you are using the text-to-speech facility to generate the speech files for the alarm messages. For an alarm to be imported and generated in ScadaPhone, the alarm(s) must be selected and one of the three buttons at the bottom of the dialog clicked. When this is done the selected alarms are imported to ScadaPhone and removed from the list.

When the **'Close' button** is clicked any remaining alarm tags in the list are not imported into ScadaPhone. The alarm message may be manually edited by selecting the alarm(s) and clicking on the **'Manually Edit Selected Items' button**. If the 'Use Default(Alarm Tagname)Alarm Message(s)' button is clicked the selected alarms are imported and just the alarm tag name is used for the alarm message. When all the desired alarm tags have been imported click the 'Close' Button. The following dialog will appear.

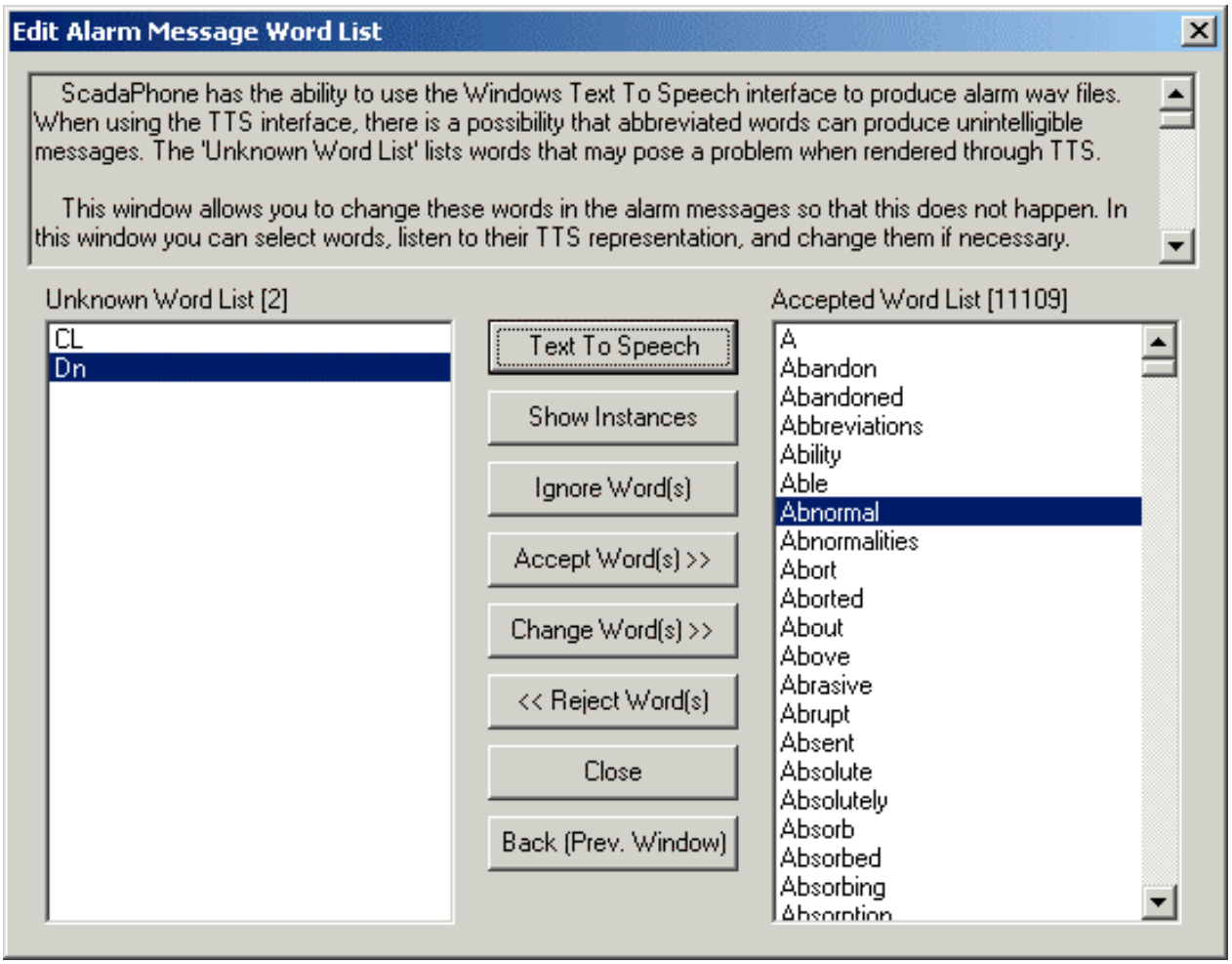


As the alarm tags are imported the words in each alarm message are compared with a list of acceptable words that work well with the text-to-speech generator. Any not found are flagged for editing. The above dialog allows ScadaTec to learn of new words that we have not thought of and add then to the list.

Click one of the two buttons.

If any alarm message contain text that is not in the acceptable word list then the following Dialog will appear.

Edit Alarm Message Word List Dialog



ScadaPhone has the ability to use the Windows Text To Speech interface to produce alarm wav files.
When using the TTS interface, there is a possibility that abbreviated words can produce unintelligible
messages. The 'Unknown Word List' lists words that may pose a problem when rendered through TTS.

This window allows you to change these words in the alarm messages so that this does not happen. In
this window you can select words, listen to their TTS representation, and change them if necessary.

ScadaPhone comes pre-configured with approximately 10,000 known words; your project may be using
valid words that were simply omitted from the 'Accepted Word List'; if this is the case and some of the words
in the 'Unknown Words List' are valid, simply highlight them and click the 'Accept Word(s)' button to have
them included in the 'Accepted Word List'.

If you intend to manually record wav files to enunciate the alarms you've just defined, thereby

bypassing
the Text To Speech interface, editing the word list is unnecessary. If you do intend to allow ScadaPhone to use the Text To Speech interface to produce the alarm wav files, here is a brief description of how the buttons on this window function:

The **'Text To Speech' button** allows you to hear the TTS rendering of any words that are highlighted in
either the 'Unknown Word List' or the 'Accepted Word List'. If you are satisfied with TTS rendering of any
word or abbreviation in the 'Unknown Word List', you can click the '**Accept Word(s)' button** while that word
is highlighted and it will be moved into the 'Accepted Word List'. If you don't like the rendering of any word
that is in the 'Accepted Word List', you can click the '**Reject Word(s)' button** and it will be moved into the
'Unknown Word List'. **Note:** These list boxes are 'multi-select' list boxes; so you can select one or more
items by holding either the <Shift> or <Ctrl> keys while clicking items in either list.

The **'Show Instances' button** will only be enabled when exactly one item in the 'Unknown Word List' is
highlighted. This opens a window that shows you a list of alarm messages that include the word in question.
The word in question will be displayed in red so that you can easily see where it is being used.

The **'Ignore Word(s)' button** will remove word(s) from the 'Unknown Word List' without transferring them to
the 'Accepted Word List'. This button can be used if the word(s) in question are acceptable in the context of
the current project, but will probably never be used in any other project.

The **'Accept Word(s)' button** moves the highlighted word(s) from the 'Unknown Word List' into the 'Accepted Word List'. These words will be saved into the 'AcceptedWordList.txt' file so that they will be
available in future projects where the Alarm Message Generator will be used.

The **'Change Words' button** will build a list of all highlighted words in the 'Unknown Word List' and then
prompts you to enter a new word to replace the unknown word. Any changes made in the 'Change Word'
dialog will be applied to the alarm messages currently being generated. For example: If 20 alarms that were
highlighted in the 'Alarm Message Generator' contain the abbreviation 'gals' to represent the word 'gallons',
changing the word 'gals' to 'gallons' in the 'Change Word' dialog would also change the word in each of the
20 alarms that use the abbreviation 'gals'.

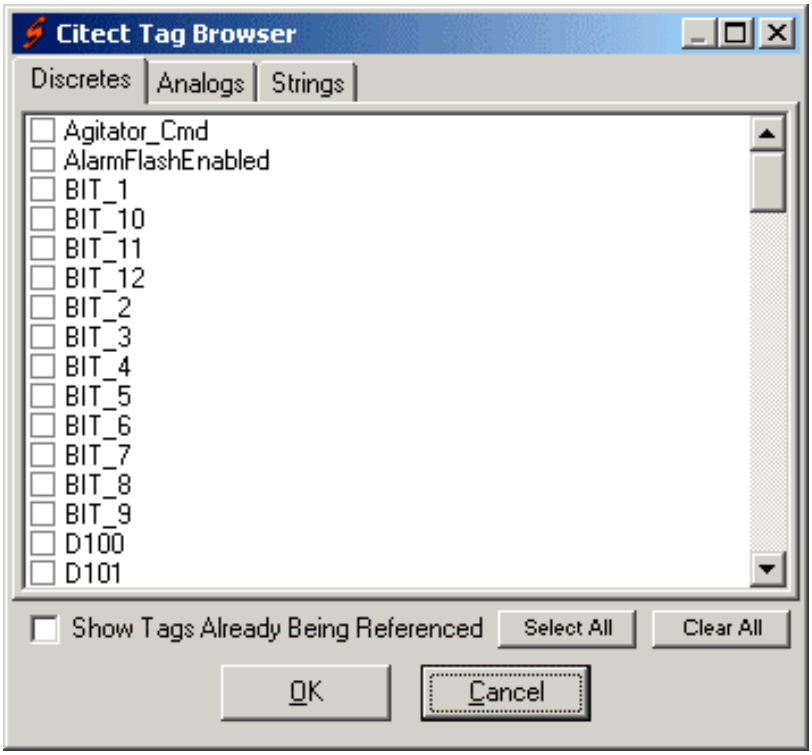
The **'Reject Word(s)' button** will move items from the 'Accepted Word List' into the 'Unknown Word List'
where they can be changed. This is sometimes necessary if you've accepted words and then realized that
you don't like the way TTS renders them.

The **'Close' button** closes the Word List window and leaves all remaining items in the 'Unknown Word
List' unchanged. The alarms will be generated as soon as this window closes.

The **'Back (Prev. Window)' button** allows you to return to the Alarm Message Generator if you decide that
you don't like the message construction of the alarms you've accepted in the Alarm Message Generator.
After being returned to the Alarm Message Generator, you can change the alarm message composition or
change the alarm selection(s).

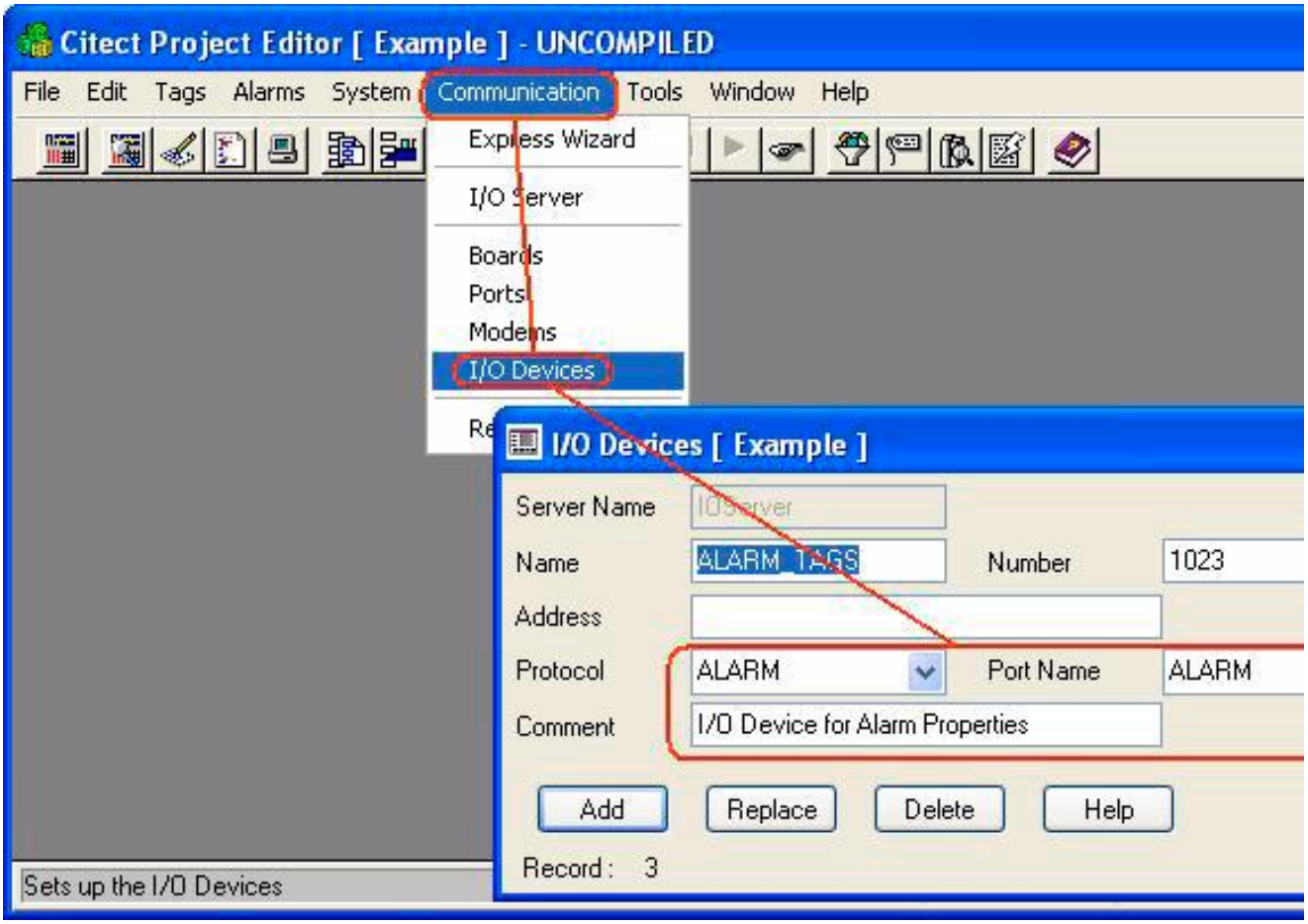
Importing CitectSCADA Analog, Discrete, and String Tags

Clicking on the 'New' button in the Analog, Discretes, or Strings tab bring up a dialog that allows new tag names to be entered. Existing tags from the CitectSCADA software may be imported by clicking on the 'Browse Citect' button. This will bring up the following dialog box.



One or more tags may be selected. When the 'Ok' button is clicked the selected tags are imported into ScadaPhone.

PLEASE NOTE:
In order for ScadaPhone to be able to retrieve alarm information from Citect via the Citect Alarm Browser, the Citect project needs to have the following I/O device defined:



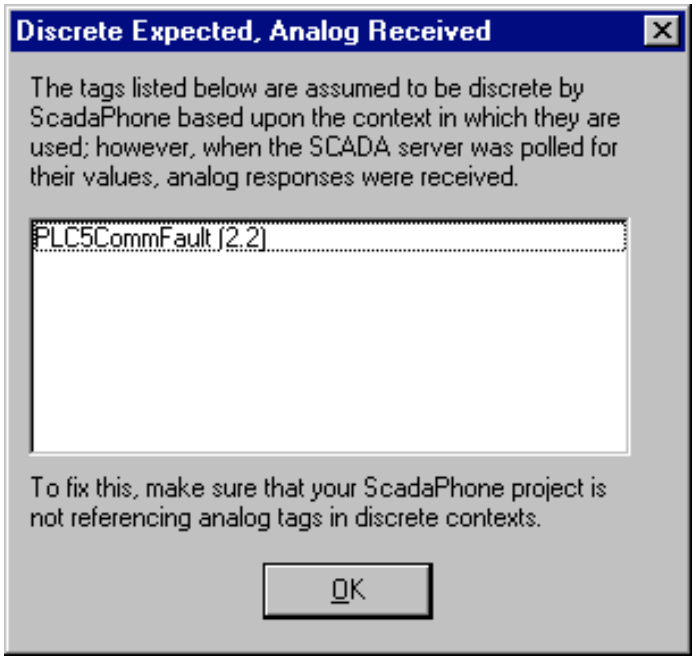
If this I/O device does not exist in your Citect project, use the Citect Project Editor to insert this device. After this device has been added, you will be able to browse for alarms via ScadaPhone's alarm browser.

Creating Custom Install Programs

A developer may wish to configure ScadaPhone with a default project that can be installed on a new system. There is a separate install program called *ScadaPhoneMakeInstall.exe*, which will create a custom install program. This custom install program will install ScadaPhone with a custom project as the default. Contact ScadaTec for details.

Discrete Expected, Analog Received

When ScadaPhone is polling tag values and receives an analog response for a discrete tag, the **Discrete Expected, Analog Received** window pops up:



The window displays a list of the tag(s) whose values are analog but are defined by the ScadaPhone project as discrete. To fix this, make sure the ScadaPhone project is not referencing an analog tag as a discrete tag. For example, an analog tag name may have been placed on the main window's **Discretes** tab.

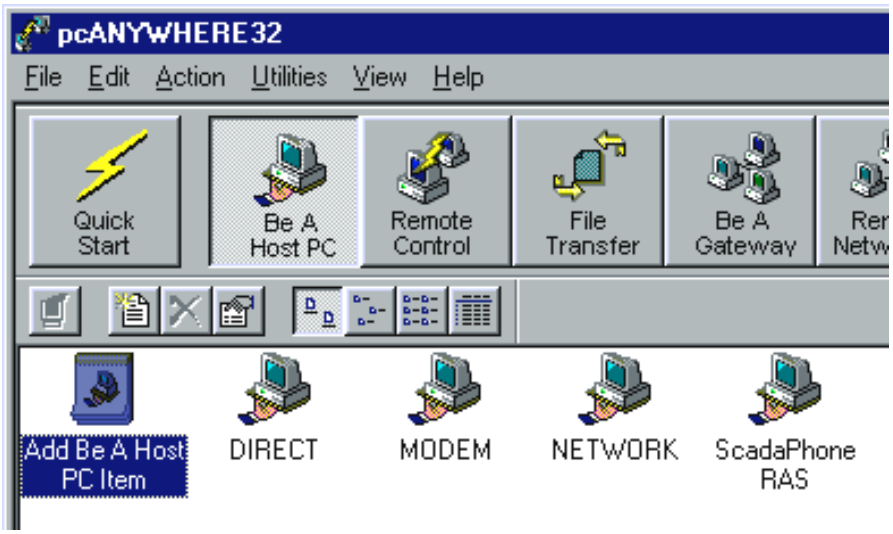
The **Discrete Expected, Analog Received** window may be opened from the main menu by selecting **SCADA Link | Discrete Representations**. This opens the **Discrete Representations** window. Click the **Analog Response List** button in the lower right corner to open the **Discrete Expected, Analog Received** window.

Related topic: Setting Discrete Representations

Remote Access Software (RAS) Interface

ScadaPhone's **RAS Interface** allows the use of remote access software such as Symantec's **pcAnywhere** on the same modem and telephone line as ScadaPhone. ScadaPhone has a special menu item action to launch the RAS. Before launching the RAS, ScadaPhone releases control of the voice modem so that the RAS can use it to make its connection. When the RAS is closed, ScadaPhone re-assumes control of the voice modem. The following example uses **pcAnywhere** for configuration.

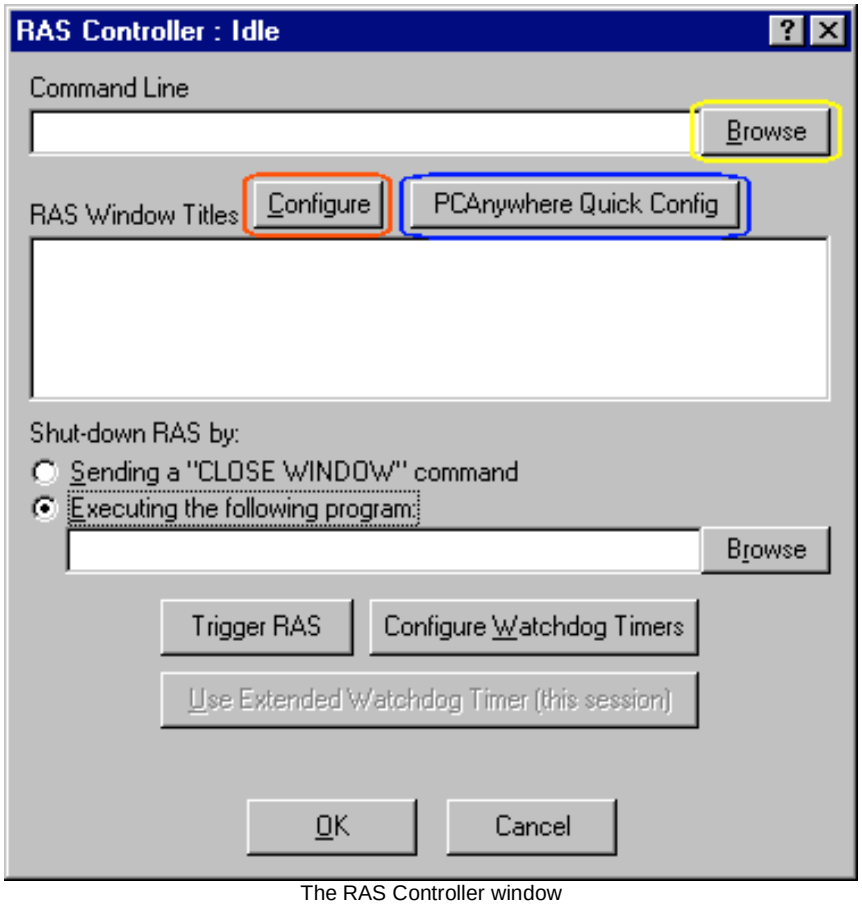
First, start **pcAnywhere** as normal. A **"Be A Host PC"** item needs to be created and it will be configured to use the voice modem provided with ScadaPhone. To avoid conflicts during this set-up, either shut-down ScadaPhone or remove the check mark next to the "*Automatically launch after wizard*" option in step 3 of the "**Add Be A Host PC Item**" configuration wizard. In order to make this host item's configuration file easy to find, name it "**ScadaPhone RAS**" as in the example below:



pcAnywhere with ScadaPhone RAS file

After this item is created, exit **pcAnywhere**.

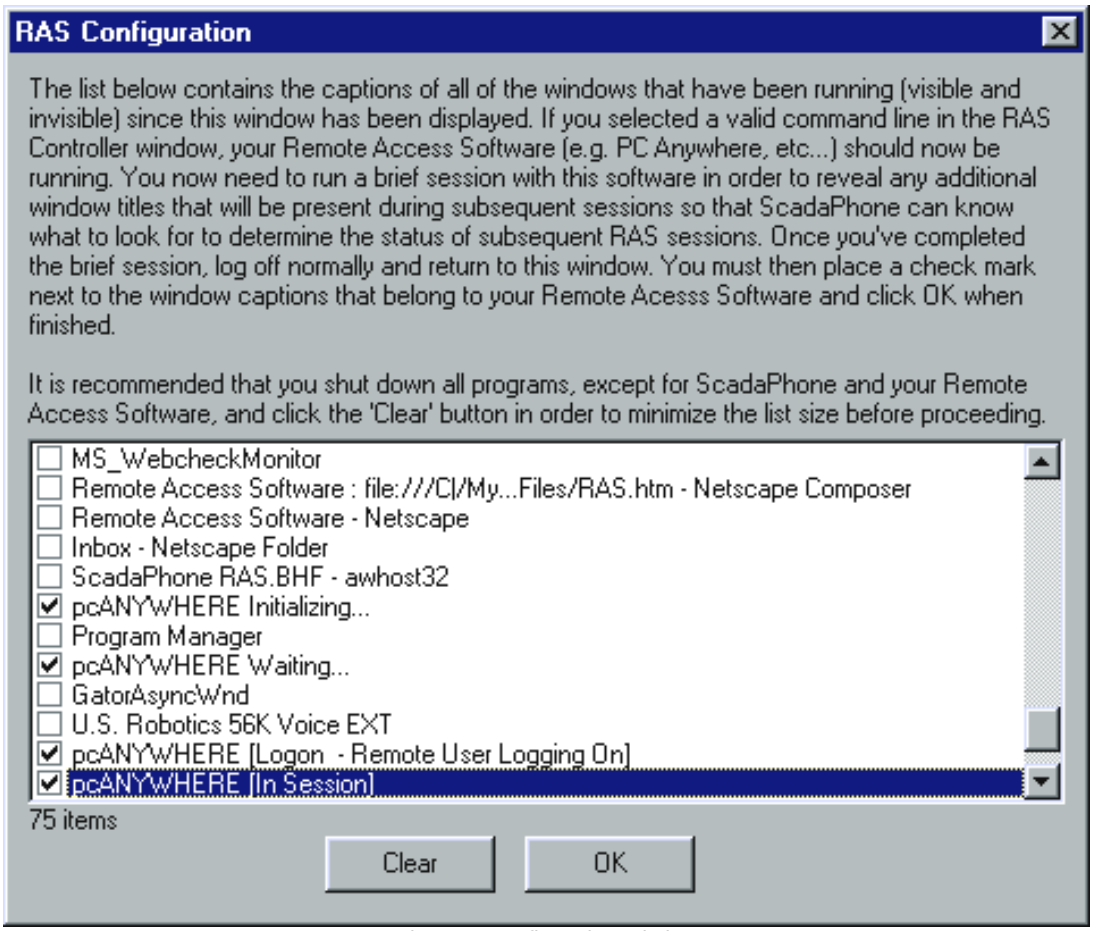
Next, open ScadaPhone's **RAS Controller** window by selecting from the main menu **Options | Remote Access Software:**



The RAS Controller window

The RAS Controller window allows a pre-defined RAS host item to be started. (In this example, **pcAnyWhere** "**ScadaPhone RAS**".) To configure the RAS option, fill in the controls on this window from top to bottom, starting with **Command Line.** To fill in the **Command Line** edit box, it's easiest to use the **Browse** button (circled in yellow). For this **pcAnywhere** example, navigate to the **Data** folder under **pcAnywhere**'s main program directory and select the file name "**ScadaPhone RAS.bhf**". Next, the **RAS Window Titles** needs to be setup. ScadaPhone will watch for these window titles to determine if pcAnywhere is still running. If ScadaPhone fails to locate one of these window titles, ScadaPhone assumes that the remote access session has been terminated and ScadaPhone re-assumes control over the voice modem. To configure **RAS Window Titles**, click the **Configure** button (circled in red).

When the **Configure** button is clicked, ScadaPhone will launch the pcAnywhere host item specified in the Command Line box. Therefore, in this example, **pcAnywhere** should launch the **ScadaPhone RAS** host. In addition to launching the pcAnywhere host, the RAS Configuration window will appear:



The RAS Configuration Window

This window lists the titles all of the windows currently running (visible or not). The list should display window titles pertaining to pcAnywhere. At right, two pcAnywhere windows are shown with checkmarks: **pcAnywhere Initializing...** and **pcAnywhere Waiting...**

There are more **pcAnywhere** window titles that need to be included; the window titles will change as soon as someone calls in and starts a remote control session with this host. Therefore, a brief session must be started in order to get these window titles to be included in the list.

As soon as the remote control session starts, these new window titles should be displayed:

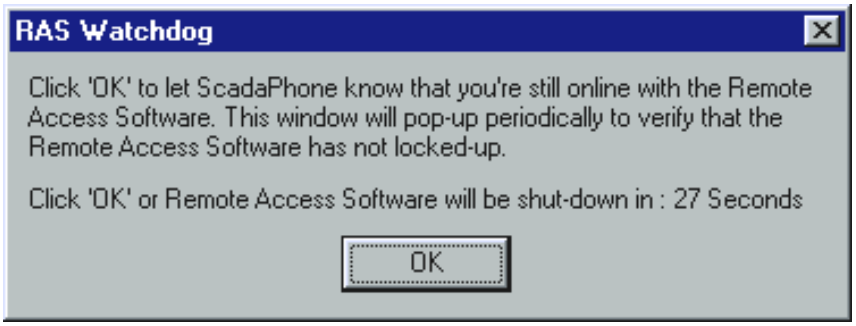
- **pcAnywhere [Logon - Remote User Logging On]**
- **pcAnywhere [In Session]**

Put check marks next to all of the pcAnywhere windows and click **OK**. A prompt should appear to shut down the RAS (pcAnywhere) before continuing. Shutdown the RAS and ScadaPhone will return to the **RAS Controller** window.

Typically, the Remote Access Software will be terminated by the person that has requested the remote control session when he or she has finished; however, in some instances it may become necessary for ScadaPhone to shut down the RAS (e.g. the RAS session terminated abnormally and the RAS is locked up). The **Shut-down RAS** controls specify how the shut down is to be performed. In some cases, it may be possible to send a simple "CLOSE WINDOW" command through the operating system. In the case of pcAnywhere, there is a utility program specifically for this purpose. For this example, click the "**Executing the following program**" radio button and click the **Browse** button to locate "**Stophost.exe**" in pcAnywhere's main program folder.

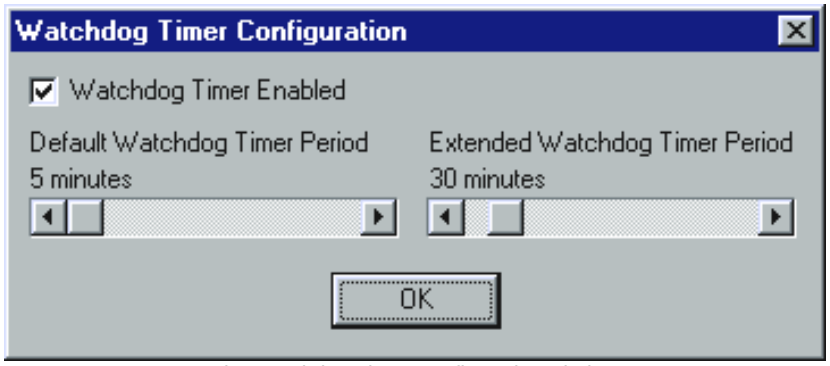
If **pcAnywhere** is being used, the **PCAnywhere Quick Config** button may be used. Clicking this button sets up the **RAS Windows Title** box as well as the two command line edit boxes. NOTE: **pcAnywhere** must be installed on the computer for this to work. If the text in the command line edit boxes is red, this means that ScadaPhone could not find the "**ScadaPhone RAS.bhf**" file created above. Click on the **Browse** button and locate "**ScadaPhone RAS.bhf**".

The last item to examine on the **RAS Controller** is the Watchdog Timer. The watchdog's purpose is to make sure that the RAS software has not locked up or remained idle thereby preventing ScadaPhone from recapturing the voice modem's COM port. Every five minutes (by default) the **RAS Watchdog** window appears and asks the remote user to click an **OK** button to let ScadaPhone know that the remote control session is still in progress. If the **OK** button is not clicked within 30 seconds, ScadaPhone will force the RAS to close.



The RAS Watchdog window

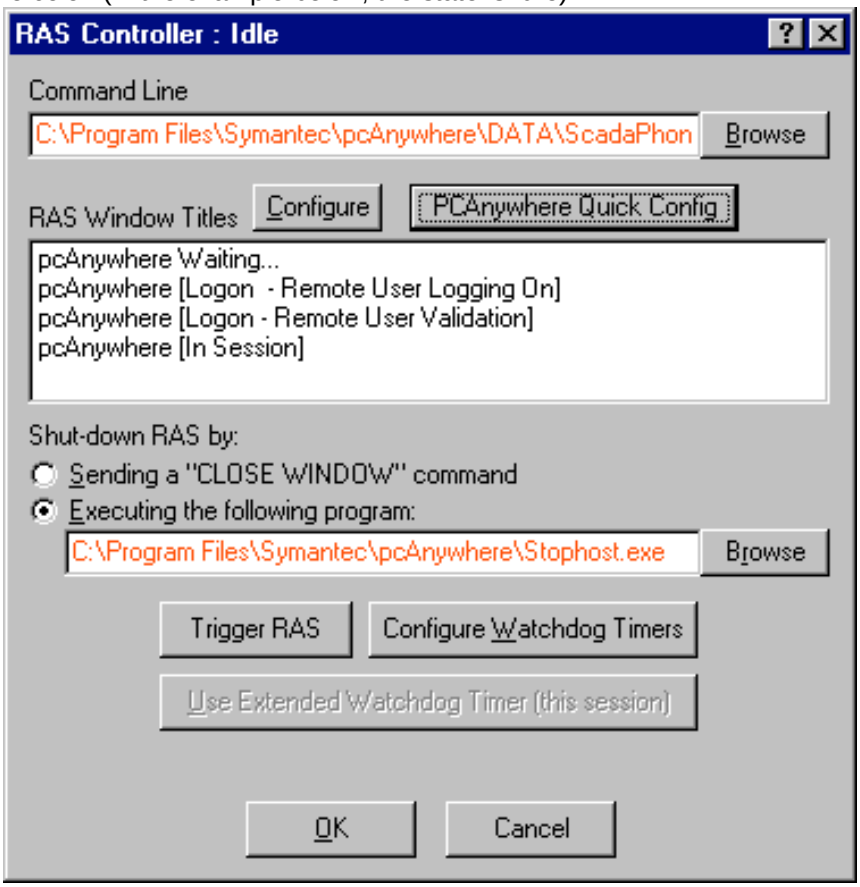
The watchdog can be set to use two different time-out periods: default and extended. The default period is used unless the **Use Extended Watchdog Timer** button has been clicked. The extended period is useful when the remote control user wants to download a file which will take longer than the default watchdog period.



The Watchdog Timer Configuration window

Click **OK** to close the **Watchdog Timer Configuration** window and to return to the **RAS Controller** window.

Once the **RAS Controller** is configured, the RAS interface may be tested by clicking the **Trigger RAS** button. Watch the title bar on this window and notice that the current state of the RAS controller is displayed after the colon (in the example below, the state is **Idle**).



The RAS Controller window in an Idle state

Click the **OK** button to exit the **RAS Controller** window and return to ScadaPhone.

ScadaPhone's OLE Server

Overview

ScadaPhone can be used as an ActiveX(OLE) server. This is not to be confused with ScadaPhone's ability to access SCADA software data using the OLE protocol.

Accessing ScadaPhone's OLE server

The OLE server class string is 'ScadaPhone.ScadaPhoneTagServer'.

Methods Available

GetTagValue(TagName: WideString): WideString
Returns the value of TagName as a string.

ReloadProject()
This causes ScadaPhone to reload the current ScadaPhone project. This is useful if you want to be able to change the project remotely over a network and then cause ScadaPhone to load and run the changed project without manually going to the PC on which ScadaPhone is running to restart it.

GetAckStatus(const AlarmName: WideString): WordBool
Returns TRUE if AlarmName is active and acknowledged, FALSE if AlarmName is either clear or active and un-acknowledged.

GetTagList(IncludeDataType, IncludeValue: WordBool): WideString
Returns a list containing every tag name separated by <CR><LF>. If IncludeDataType and Includevalue are set to TRUE, each line includes the data type and tag value separated by commas.

GetAlarmList(IncludeAlarmStatus, IncludeAckStatus: WordBool): WideString
Returns a list containing every alarm separated by <CR><LF>. If IncludeAlarmStatus & IncludeAckStatus are TRUE each line includes the AlarmStatus and AckStatus separated by commas.

Shutdown()
Causes ScadaPhone to shut down.

DoNotShutdown()
DoNotShutdown is called by RestartScadaPhone if the operator clicks the "Delay Restart (5 minutes)" button. When DoNotShutdown is called, a timer in ScadaPhone (OLEShutdownIgnoreTimer) is reset so that events that would normally launch RestartScadaPhone are suppressed.

GotoDevelopmentMode()
Switches ScadaPhone to development mode

GotoRunMode()
Swiches ScadaPhone to run mode

LoadProject(Projectname)
Causes ScadaPhone to load 'Projectname'.

GetExePath(): WideString
Returns the path to the ScadaPhone EXE file.

SetTagValue(TagName, NewVal: WideString)
Sets the value of 'TagName' to 'NewVal'.

Accessing the ScadaPhone OLE server

These functions are accessed in the standard ActiveX(OLE Automation) manner from Visual Basic, C++, Delphi, or any other application that supports the instantiation and use of out-of-process ActiveX components. Sample programs are available in Delphi and Visual Basic from ScadaTec technical support.

The syntax for creating a reference to the ScadaPhone server is:
1.) In Delphi

```
private
  { Private declarations }
  OLEServer:Variant;
  OLEServer := CreateOLEObject('ScadaPhone.ScadaPhoneTagServer');
```

2).In Visual Basic

```
Dim oScadaPhone As ScadaPhone.ScadaPhoneTagServer
Set oScadaPhone = CreateObject("ScadaPhone.ScadaPhoneTagServer")
```

ScadaPhone's OPC Server

Overview

ScadaPhone can be used as an OPC server. This is not to be confused with ScadaPhone's ability to access SCADA software data using the OPC protocol. The ScadaPhone OPC server follows the OPC standard which is too complicated to reproducer here. For documentation on the OPC protocol please visit the OPC organization web site at www.opcfoundation.org. **NOTE**: ScadaPhone only supports the OPC DA Version 1 and 2 standard.

Accessing ScadaPhone's OPC server

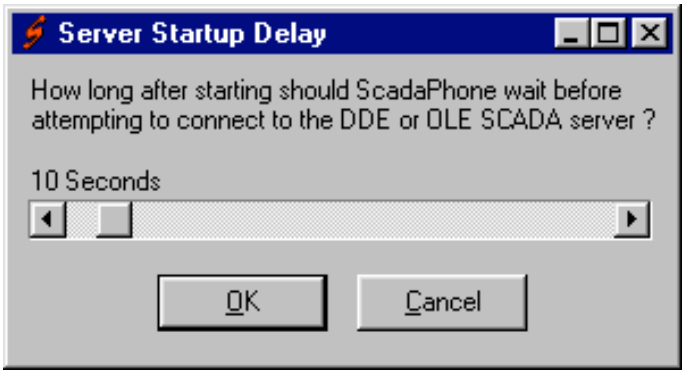
The program ID (ProgID) needed to attach to ScadaPhone's OPC server is:
ScadaPhone.OPCServer.1

Most OPC DA clients will connect to the ScadaPhone OPC server using the above ProgID.

Server Startup Delay

ScadaPhone may be configured to wait a number of seconds at program startup before attempting to link to the SCADA server. This feature fixes a problem that may arise on system startup: if the SCADA software and ScadaPhone are both configured to launch when the system starts, ScadaPhone can start asking for tag values before the SCADA software is ready to handle these queries. In some cases, this can cause run time errors in the SCADA system and have a fatal effect on the SCADA startup.

To set how many seconds ScadaPhone should wait before linking to the SCADA server, ScadaPhone must be in development mode. From the top menu, select **ScadaLink | Server Startup Delay**. This will open the **Server Startup Delay** window:



Use the slider bar to set the number of seconds ScadaPhone should wait before connecting to the SCADA server.

Setting Discrete Representations

Setting Discrete Representations

About Discrete Representations

Some SCADA packages return discrete TRUE and FALSE values with different text strings. For example, Intellution's Fix software can be configured to return OPEN for FALSE and CLOSE for TRUE. In addition, some software packages may represent TRUE as -1 rather than the norm of 1. ScadaPhone can be configured to understand these non-standard representations of discrete values.

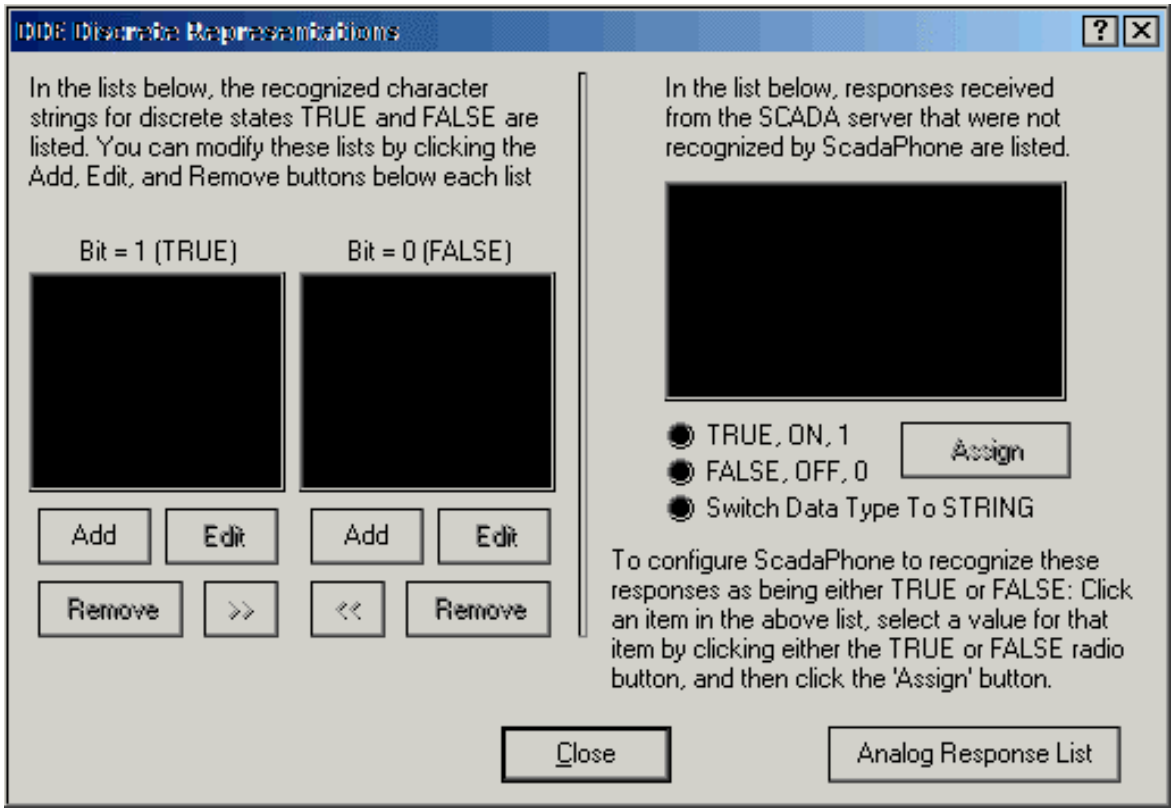
When ScadaPhone is first installed, it is configured to recognize the text strings "CLOSE", "ON", "TRUE", as well as the value 1 as representing a TRUE state. The strings "OPEN", "OFF", and "FALSE" as well as the value 0 are used to represent a FALSE state.

Non-standard Discretes at Runtime

In most cases, non-standard discrete strings are revealed at runtime. If ScadaPhone receives an undefined response for a discrete query, the **Discrete Representations** window is displayed with the undefined response(s) shown in the list box on the right side of the window. If this happens, highlight an item in the response list, click either the TRUE or FALSE radio button as appropriate, and then click the Assign button.

Adding/Editing Discrete Values from the Menu

To configure Discrete Representations, click **SCADA Link | Discrete Representations** from the main screen's top menu. This opens the **Discrete Representations** window:



To add a non-standard text string for a TRUE state, click the **Add** button under the **Bit = 1 (TRUE)** list box on the left side of the window. To add a non-standard text string for a FALSE state, click the **Add** button under the **Bit = 0 (FALSE)** list box. This will open a window that allows you to enter a text value for a discrete representation:

Window to add a Discrete Representation for a TRUE state

Click the **OK** button when finished typing the text string. This will add the text value to the appropriate list box.

If a text string displayed in a list box needs to be edited, click on that string and click the **Edit** button.

If a text string needs to be moved from the TRUE list box to the FALSE list box or vice-versa, select the string and click on the >> or << button to move the string from one list box to the other.

Invalid Discrete Responses

When new discrete tags are added or imported, ScadaPhone assumes that they are valid discrete tags and will return a recognized discrete response. When a non recognized discrete, analog or string value is received from the SCADA system for a discrete tag, ScadaPhone will display a list of the unrecognized responses received in the right hand list box. Select one or more responses and click the appropriate radio button to tell ScadaPhone to recognize the response as either a valid True or False discrete value or to redefine the non discrete tags that returned the unrecognized response.

Analog Response List button

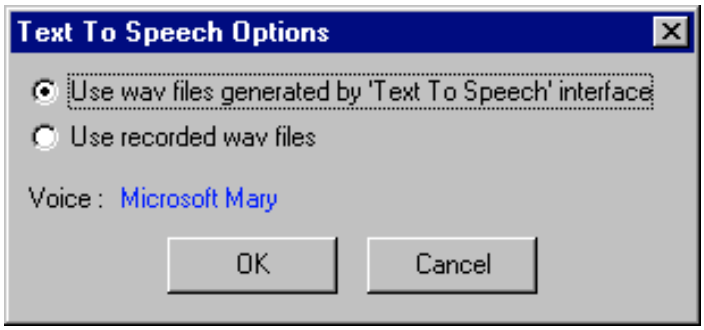
Clicking the **Analog Response List** button in the lower right corner of the **Discrete Representations** window displays a list of tags assumed to be discrete by ScadaPhone but when polled returned analog values. ***See***: Discrete Expected, Analog Received

Text To Speech Interface

The text to speech (TTS) functionality in ScadaPhone allows the generation of voice or wav files automatically in one of several voices. It may be accessed in several ways. First, by selecting 'Options | Text To Speech' from the main menu.

Selecting this option causes ScadaPhone to generate the speech WAV files for tag names and text. This can be used instead of actually recording the WAV files for the alarm announcement text. **Note:** This optional feature requires that the Microsoft voice and speech components be installed. The MS Installer files needed to install the Microsoft voice and speech components are SAPI5SpeechInstaller.msi and SAPI5VoiceInstaller.msi. They are usually included on the install CD and are available from the downloads directory on the ScadaTec web site. www.scadatec.com/downloads or from technical support.

Selecting this menu option opens the **Text to Speech Options** window.



This window allows the user to choose whether to use the recorded WAV files or the WAV files generated by the text to speech interface. If the option to use the WAV files generated by the text to speech interface is selected, then the voice that will be used may be selected by clicking on the blue text following the **Voice:** option. After selecting the 'Text to Speech' option and clicking the **OK** button, ScadaPhone will begin converting all of the existing user and system WAV files into WAV files to the selected voice. The WAV files are saved in separate folders, *\ScadaPhone\SystemFiles\TTS* and *\ScadaPhone\Projects\projectname\TTS*.

If the 'Text to Speech' option is selected, the **Record** button on the main window's **Wav Files** and **System Wavs** tabs will change from **Record** to **Generate**. Selecting an existing WAV file and clicking on the **Generate** button will generate a new WAV file replacing the selected WAV file. The new WAV file will use the currently selected voice; the voice speaks the name of the WAV file. The windows that the **Edit** and **New** buttons bring up also have a **Generate** as well as a **Record** button. If the 'Use wav files generated by Text To Speech interface' option has been

selected in the Text To Speech options window, clicking the **Generate** button will save the resulting file will be saved in the TTS directory, otherwise it will be saved in the project directory. The alarm 'Message Segment' window also includes a **Generate(TTS)** button.

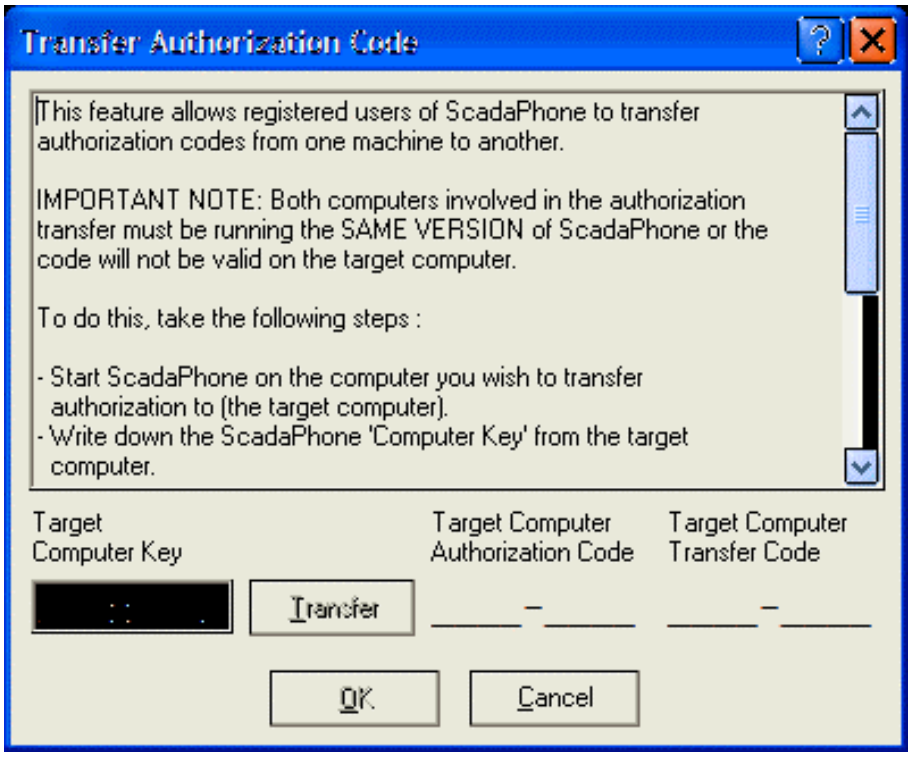
Wav files which are referenced in the ScadaPhone project but do not exist will automatically be generated by the TTS interface if it is available.

Note: It is imperative that the name of the WAV file be the text that the voice is to speak. Example: If the WAV file contains the phrase, "Chlorine tank level low" the file name should be *ChlorineTankLevelLow*.wav. (ScadaPhone automatically appends .WAV to recorded WAV files.) Spaces between the words in the WAV file name are optional.

Transfer Authorization Code

This feature allows registered users of ScadaPhone to transfer authorization codes from one PC to another. Transferring authorization codes is done in development mode.

To transfer authorization codes, first start ScadaPhone on the source computer. Open the **Transfer Authorization Code** window by clicking on the main screen's menu **File | Program | About** and clicking on the blue [**Full | Lite**] **System Enabled** text. A supervisor password must be entered to transfer the authorization code. When a valid password is entered, ScadaPhone will display the following window:



Next, do the following:

- Start ScadaPhone on the computer you wish to transfer authorization to (the target computer).
- Write down the ScadaPhone 'Computer Key' from the target computer. (On ScadaPhone's main menu, click on **File | Program | About** to display this number.)
- Enter the target computer's key number in the designated space on the source computer.

- Click the **Transfer** button. This will display an authorization code and transfer code for the target computer and disable ScadaPhone on the source computer.
- Enter the authorization and transfer codes from the previous step into the registration window of the target computer.

ScadaPhone will be enabled on the target computer and disabled on the source computer. Repeat this procedure at any time to transfer authorization again.

Troubleshooting

Tools

Tool:	*Use:*
Activity Log	Log of all system activity (Window | Activity Log). Schedule Holes, Duplicate Passwords, and Missing Menus are also logged to the Activity Log each time their respective warning windows are displayed.
Audio Analyzer	Visual display of audio files. May be used to help troubleshoot problems with answer detection scripts (Window | Audio Analyzer)
Contact Sequence Log	Log of contact calls and changes (Window | Contact Sequence Log)
Email Log	Log of email activity (Window | Email Log)
Find References	Allows the user to find all the places in ScadaPhone where a selected tag is referenced.
Invalid Modem Response Log	File of invalid modem responses. Saved in a file named: .\InvalidModemModelResopnces.txt .(For factory troubleshooting, not accessible from ScadaPhone).
CLogViewer	This is a log file viewer which allows log files to be combined and viewed as one file. This can help in troubleshooting by seeing all the events sequentially from the different log files combined and displayed together. It is accessed from the 'ViewArchives' menu on the various log windows.
Memory Usage	Log of ScadaPhone windows memory usage (Window | Memory Usage Log)
Modem Window	Log of modem activity. Includes optional extended diagnostics.
Modem Diagnostics Log	Contains a list that may help Tech Support diagnose modem problems.
Modem LED display	Visual display of modem LED status lights.
Print Listings	Allows printing lists of tags, menus, & WAV files
Restart Log	File of attempted automatic ScadaPhone restarts.(For factory troubleshooting, not accessible from ScadaPhone).
Run Log	Log of ScadaPhone start, stop, and run times (Window | Run Log)
SCADA Link Status	Displays SCADA link status and tag values as they are received.
SCADA Link Response Log	Log of SCADA link tag values that have been received (ScadaLink | Response Log)
System Error Log	Contains a list of any errors ScadaPhone encountered. This list is used by Tech Support to help solve any ScadaPhone problems (Window | System Error

Problems

The following is not a comprehensive list but covers some possible problems that may arise when using ScadaPhone.

Problem:	*Solution:*	*See:*

Answer detection script not working	Use the audio analyzer to troubleshoot the audio file.	The Audio Analyzer
Can not retrieve one or more tag values from Intellution Fix SCADA software	If the SCADA link status form shows 'E1212' error in place of the tag value, the problem is that the tag is set to 'Off Scan' in the Intellution Fix software. Set the tag to 'On Scan' to be able to retrieve the value.	
Discrete expected, analog received window	The ScadaPhone project may be referencing an analog tag as a discrete tag; change this reference.	Discrete Expected Analog Received
Discrete representation undefined window	If ScadaPhone receives an undefined response for a discrete query, this window is opened with undefined response(s) shown on the right side; highlight an item in the response list, click either the TRUE or FALSE radio button and click Assign.	Setting Discrete Representations
Modem error window	Click on the **Set COM Port** button or use the Select Port Window to manually set the COM port	Modem Error window
Modem hangs up and will not respond to ScadaPhone	A modem error tag can be designated that will be set to True when the modem fails to respond. This can be used to take appropriate action. This bit is specified by going to Options | Modem Error Tag on the main menu.	
Remote technical support needed	Set up a RAS session with technical support.	Remote Access Software
Response Time-out window	This is shown when no response is received form the modem. To use the PC sound card for the recording and playback of sound (WAV) files rather than the modem, click the **Disable voice modem interface** button; or click the Set COM port button to display the Select Port Window.	Setting up the Modem COM Port
Runtime errors in the SCADA system	If the SCADA software and ScadaPhone are both configured to launch when the system starts, ScadaPhone may start asking for tag values before the SCADA software is ready to handle these queries. This may can cause run time errors in the SCADA system. Select **ScadaLink | Server Startup Delay** and use the slider bar to set the number of seconds ScadaPhone should delay before starting.	Server Startup Delay

	If this does not resolve the problem, runtime errors are logged to the System Errors log. Please contact Technical Support for resolution.	
ScadaPhone displays an error message such as 'Not enough CPU time to adsorb modem stream' when it attempts to make a callout.	Turn on or increase the number of FIFO buffers on the PC. This is usually done from the 'Advanced Port Settings' dialog box from the communications port properties form, which is accessed from the Windows device manager.	
ScadaPhone cycles through SCADA system tags slowly	From the main window, select **Options|Scan Rate** and use the slider bar to adjust the rate at which ScadaPhone polls the SCADA software	Scan Rate
ScadaPhone gives errors if scan rate is too high when using DDE	From the main window, select **Options|Scan Rate** and use the slider bar to decrease the rate at which ScadaPhone polls the SCADA software	Scan Rate
ScadaPhone uses a high percentage of CPU time	From the main window, select **Options|Scan Rate** and use the slider bar to decrease the rate at which ScadaPhone polls the SCADA software	Scan Rate
ScadaPhone does not announce alarms over speaker before calling out	The most likely cause is that the option to 'Call but do not announce' option has been selected for the current schedule. Go to the Scheduler, select the current schedule name, and click the **Edit** button. Choose the correct option for the schedule.	Creating a Schedule
ScadaPhone does not work with Intellution OPC Driver version 7.11.	Upgrade to OPC driver version 7.33 or higher	
Spurious alarms	Whenever the SCADA software is shut down, ScadaPhone should be shut down first, then the SCADA software system	Spurious Alarms
Volume level on recorded WAV files differ	Select the **Wav Files** tab, highlight any wave file name and click the **Edit** button. On the **Edit Wav File** form, select **Adjust Amplitude** from the top menu. This will open the **Set Amplitude** dialog box. Adjust the amplitude of the selected WAV file or all user defined and/or system WAV files.	Adjust Amplitude

Examples

Menu_Item_Action

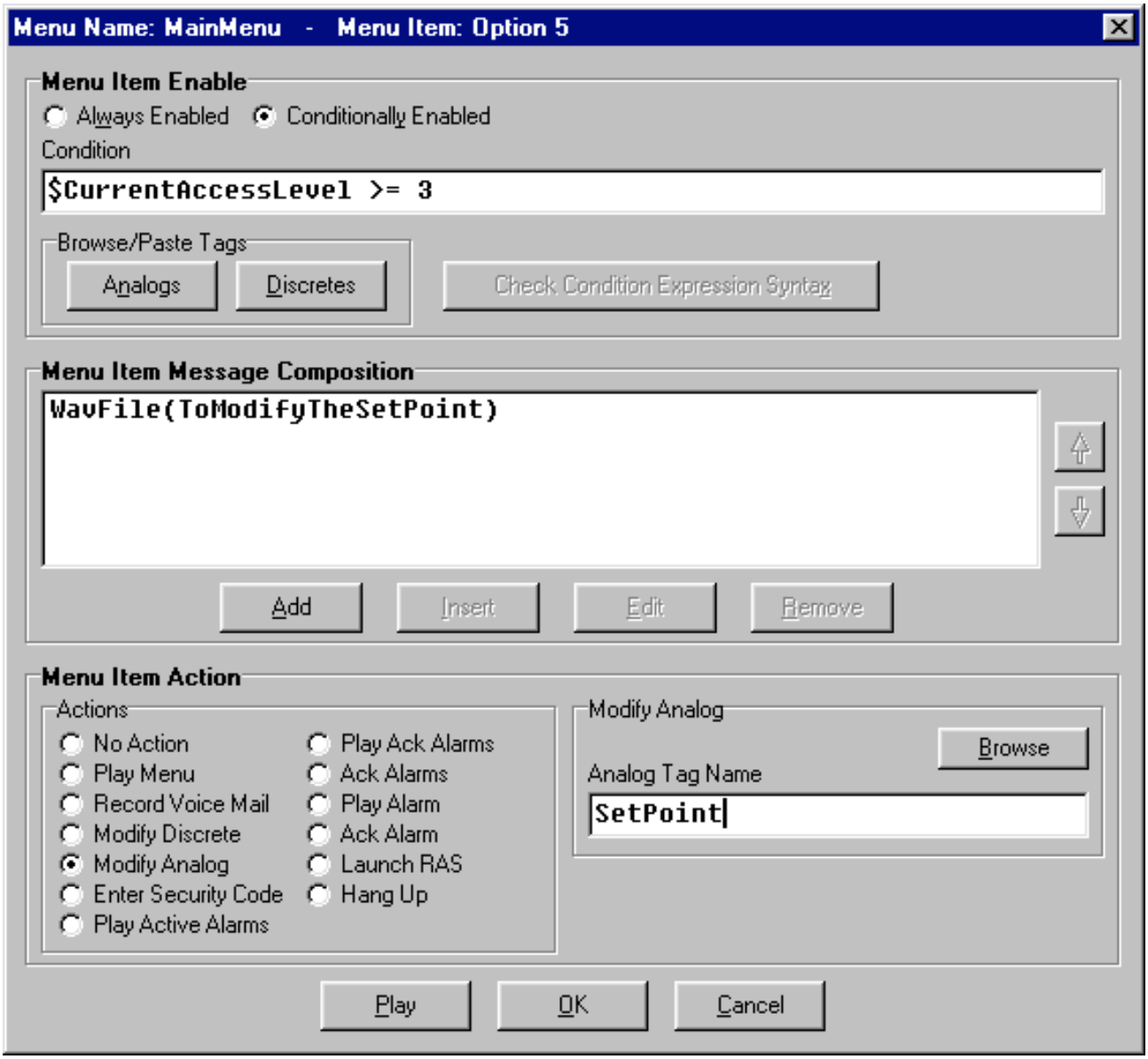
Menu Item Action Example

Modify Analog

ScadaPhone allows callers to modify SCADA system values over the phone. This feature is accomplished via the **Modify Discrete** and **Modify Analog** menu item actions. When menu options defined with these actions are selected, ScadaPhone 'pokes' data through the SCADA link interface into the SCADA system.

In this example, an option 5 will be added to the MainMenu which will allow the caller to modify an analog tag. Option 5 will prompt: "*To modify the set point, press five.*"

To modify the MainMenu, double click MainMenu on the **Menus** tab of ScadaPhone's main window. This will open the **Menu Information** window. Click the check box by **Option 5**. The label will change from gray to black, indicating that **Option 5** properties may now be edited. Click on the **Option 5** label to open the **Menu Item** window:



The Menu Item window for MainMenu option 5 - set to modify an analog value

Since this menu option allows the caller to modify SCADA system parameters it needs to be **Conditionally Enabled**. In this case, the **Menu Item Enable** condition should be `$CurrentAccessLevel >= 3`. $CurrentAccessLevel is a system variable that contains a value pertaining to the access level of the current caller. Before the caller enters a security code, this value is 0. After the caller enters a security code, the value will be 3 for Data Entry access and 4 for Supervisor access. Click the **Analogs** button to see a list of available analog names and select the system variable $CurrentAccessLevel. After the variable name, type in ">= 3". This will only allow callers who have entered a valid security code to access this option.

The message for MainMenu option 5 will consist of a single WAV file saying "*To modify the set point.*" Record a WAV file by clicking the **Add** button in the **Menu Item Message Composition** section. In the **Message Segment** window, type the filename "ToModifyTheSetPoint" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "*To modify the set point*". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window.

The **Menu Item Action** is set to **Modify Analog**. When this item action is selected, the name of the analog tag to be modified must be specified in the edit box in the Analog Tag Name edit box. For this example, assume that the SCADA system has a tag named SetPoint. If tag names are case sensitive in the SCADA system that will interface with ScadaPhone, be sure to enter all tag names exactly as they are defined in the SCADA system, including case. Use the **Browse** button to see a list of the tag names defined on the **Analog** tab.

Once the **Menu Item** window is set up, click **OK** to return to the **Menu Information** window. Click **OK** again to return to ScadaPhone's main window.

Related Topics:
Adding and Editing Menus
Modifying tag values via the telephone

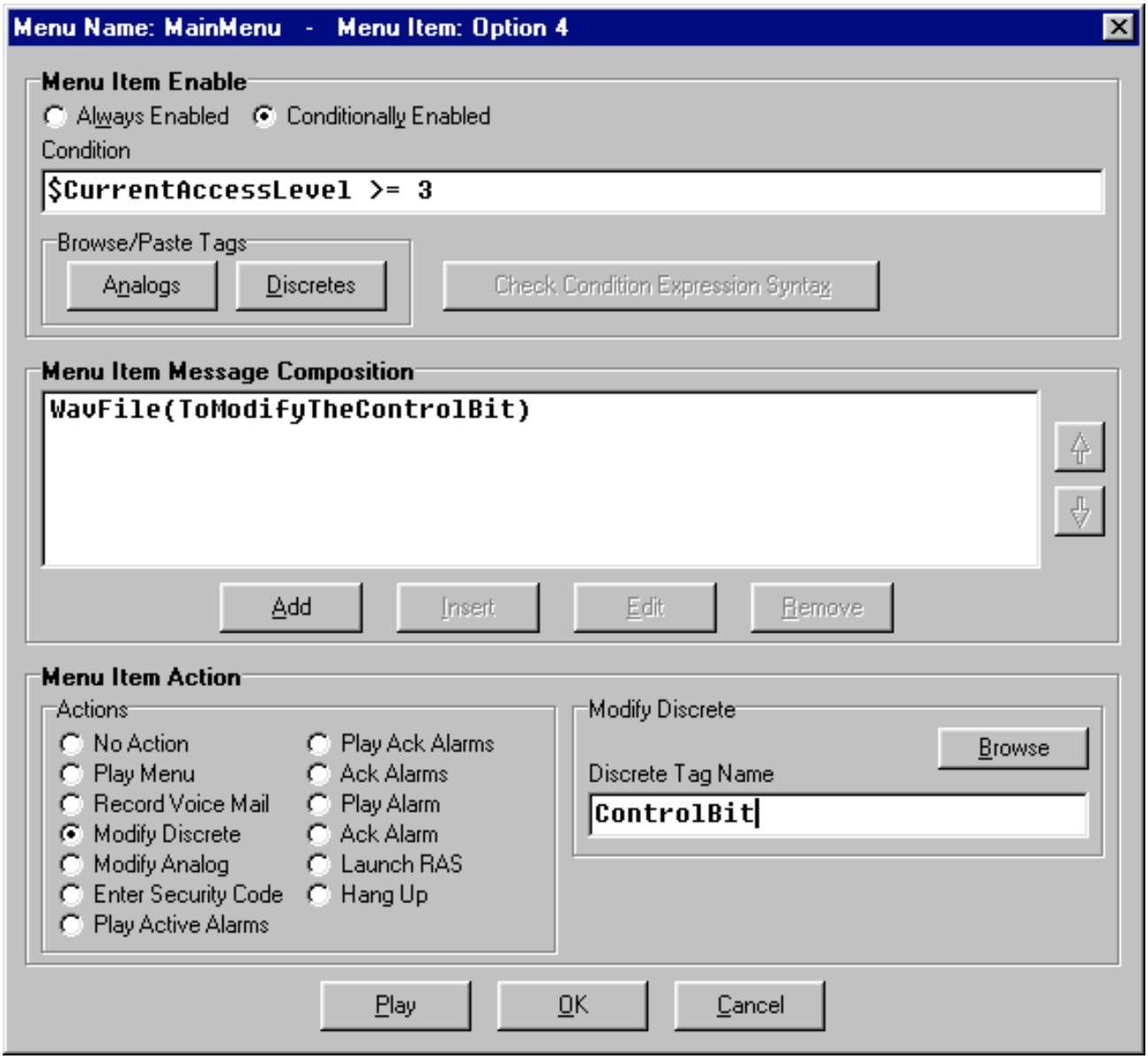
Menu Item Action Example

Modify Discrete

ScadaPhone allows callers to modify SCADA system values over the phone. This feature is accomplished via the **Modify Discrete** and **Modify Analog** menu item actions. When menu options defined with these actions are selected, ScadaPhone 'pokes' data through the SCADA link interface into the SCADA system.

In this example, an option 4 will be added to the MainMenu which will allow the caller to modify a discrete tag. Option 4 will prompt: "*To modify the control bit, press four.*"

To modify the MainMenu, double click MainMenu on the **Menus** tab of ScadaPhone's main window. This will open the **Menu Information** window. Click the check box by Option 4. The label will change from gray to black, indicating that **Option 4** properties may now be edited. Click on the **Option 4** label to open the **Menu Item** window:



The Menu Item window for MainMenu option 4 - set to modify an analog value

Since this menu option allows the caller to modify SCADA system parameters it needs to be **Conditionally Enabled**. In this case, the **Menu Item Enable** condition should be `$CurrentAccessLevel >= 3`. $CurrentAccessLevel is a system variable that contains a value pertaining to the access level of the current caller. Before the caller enters a security code, this value is 0. After the caller enters a security code, the value will be 3 for Data Entry access and 4 for Supervisor access. Click the **Analogs** button to see a list of available analog names and select the system variable $CurrentAccessLevel. After the variable name, type in >= 3. This will only allow callers who have entered a valid security code to access this option.

The message for MainMenu option 4 will consist of a single WAV file saying "*To modify the control bit.*" Record a WAV file by clicking the **Add** button in the **Menu Item Message Composition** section. In the **Message Segment** window, type the filename "ToModifyTheControlBit" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "*To modify the control bit.*" Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window.

The **Menu Item Action** is set to **Modify Discrete**. When this item action is selected, the name of the discrete tag to be modified must be specified in the edit box in the Discrete Tag Name edit box. For this example, assume that the SCADA system has a tag named ControlBit. If tag names are case sensitive in the SCADA system that will interface with ScadaPhone, be sure to enter all tag names exactly as they are defined in the SCADA system, including case. Use the **Browse** button to see a list of the tag names defined on the **Analog** tab.

Once the **Menu Item** window is set up, click **OK** to return to the **Menu Information** window. Click **OK** again to return to ScadaPhone's main window.

Related Topics:
Adding and Editing Menus
Modifying tag values via the telephone

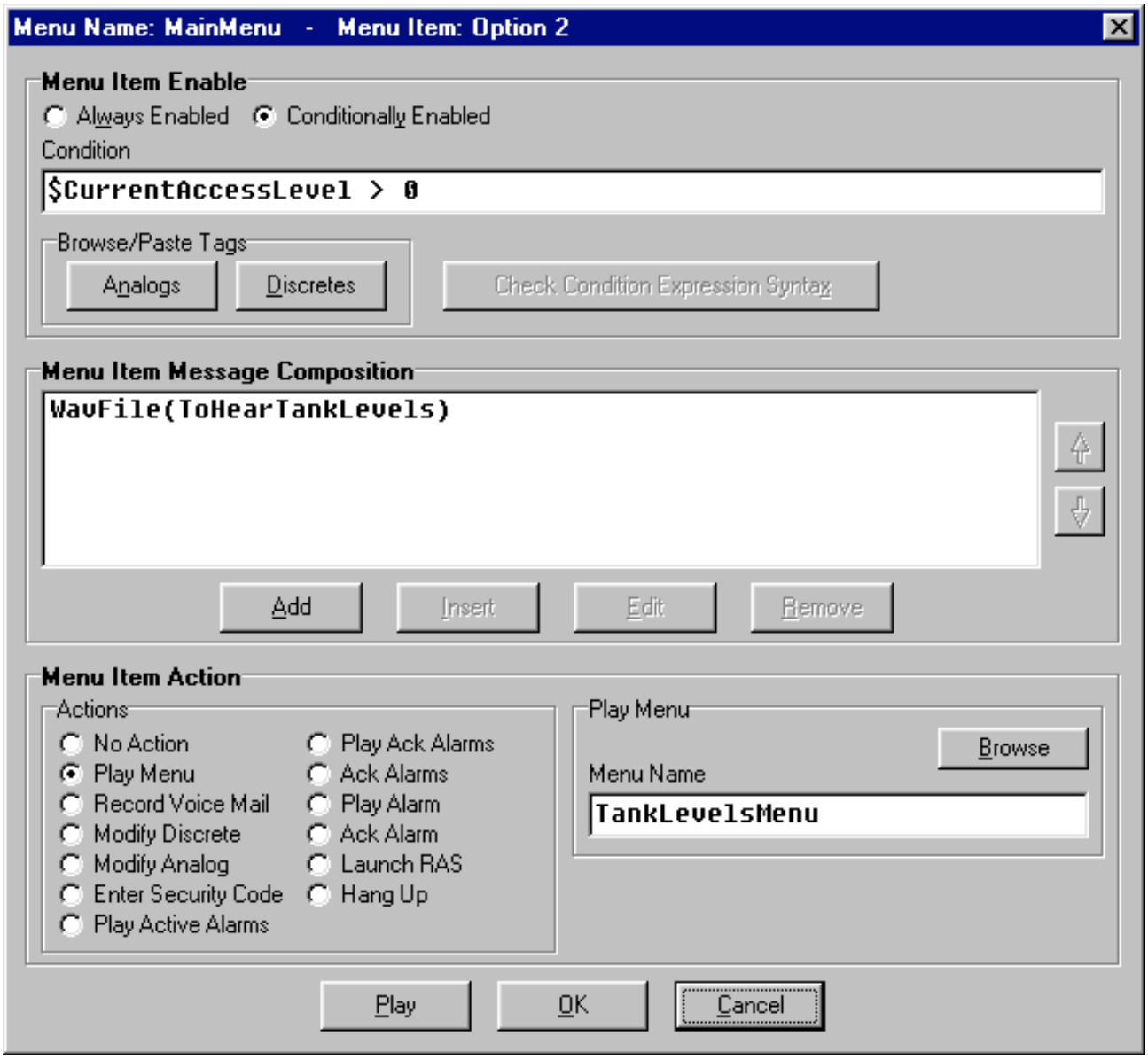
Play Menu

Menu Item Action Example

Play Menu

In this example, ScadaPhone's MainMenu option 2 will be set up to play a menu named TankLevelsMenu. The TankLevelsMenu plays the values of two SCADA system variables, ChlorineTankLevel and LowerTankLevel. These two variables must be added to the main screen's **Analog** tab. ***See**:* Entering Tag Names

To edit the MainMenu, select the **Menu** tab on the main screen, select MainMenu and click the **Edit** button. This will open the **Menu Information** window. Click the check box by **Option 2**. The label will change from gray to black, indicating that **Option 2** properties may now be edited. Click on the **Option 2** label to open the **Menu Item** window:



Menu Item window for MainMenu option 2 - set to play the TankLevelsMenu

In order to prevent unauthorized callers from accessing this menu option, it may be conditionally enabled with the condition `$CurrentAccessLevel > 0`. This will only allow callers who have entered a valid security code to access this option. Click the **Analogs** button to see a list of available analog names and select the system variable $CurrentAccessLevel. After the variable name, type in "> 0".

In the **Menu Item Message Composition** section, the message needs to say "*To hear tank levels*" (ScadaPhone automatically adds the words "*press two*". Do NOT add these words to the recorded message). To record this message, click the **Add** button. This will open the **Message Segment** window:

Message Segment window ready to record the WAV file ToHearTankLevels

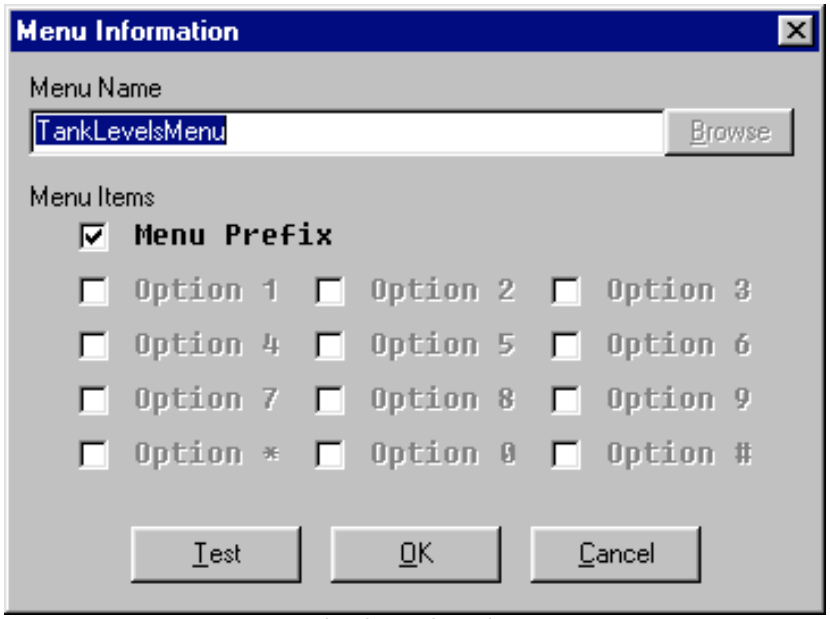
In the **Message Segment** window, type the filename "ToHearTankLevels" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "To hear tank levels". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window.

In the **Menu Item** window, the **Menu Item Action** section should be set to play the TankLevelsMenu. Click the option **Play Menu**. If the TankLevelsMenu has yet to be created, type the name "TankLevelsMenu" in the **Menu Name** box. If the menu already exists, click the **Browse** button and select the menu name. (Creating the TankLevelsMenu is described in the following section.)

Click **OK** to return to the **Menu Information** window. MainMenu option 2 is now complete. Click the **OK** button at the bottom of the **Menu Information** window to save the changes to MainMenu.

Creating the TankLevelsMenu

To create a new menu, click **New** from the bottom of the **Menus** tab of ScadaPhone's main window. This will open the **Menu Information** window. Enter TankLevelsMenu in the **Menu Name** box:



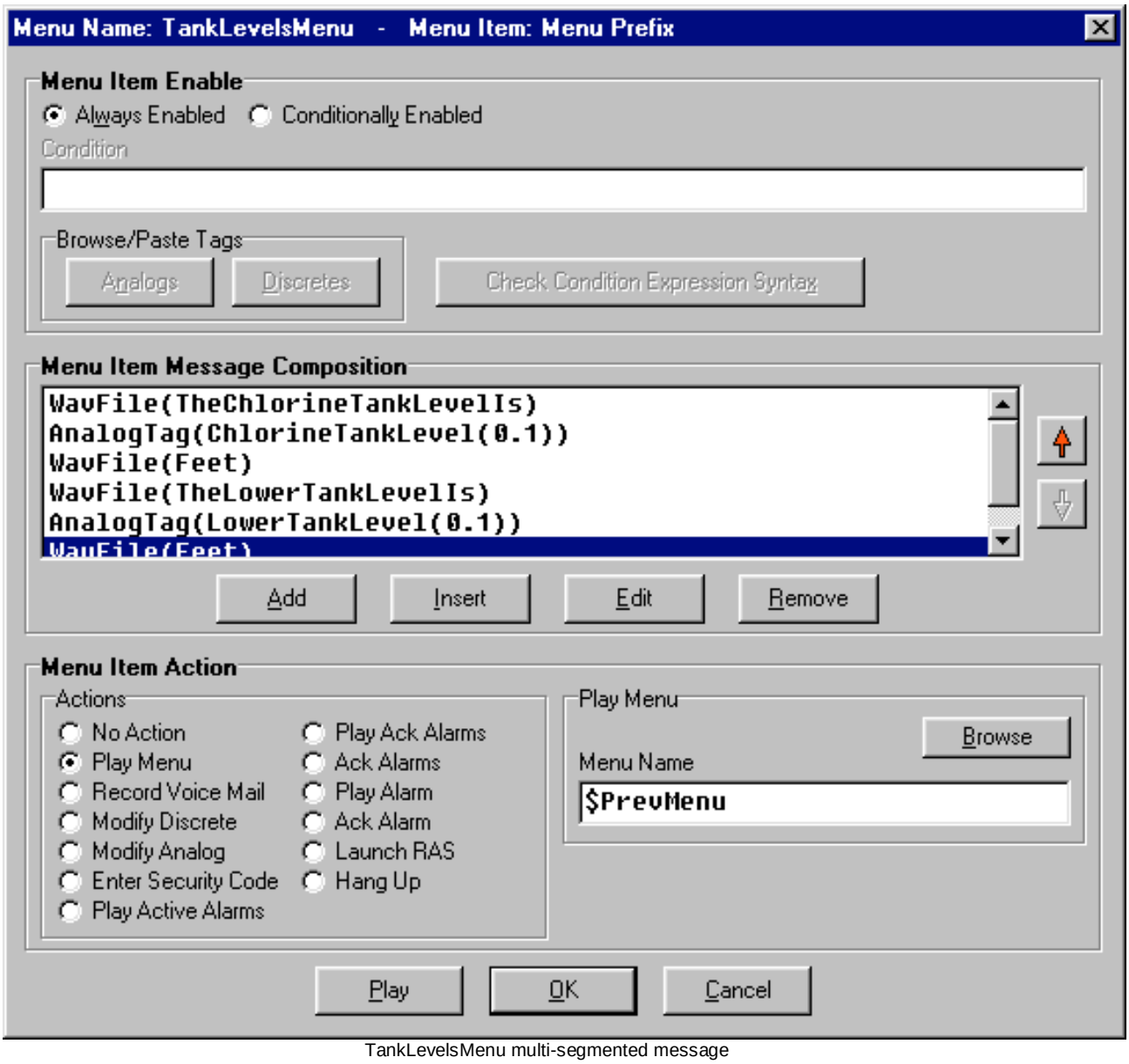
Creating the TankLevelsMenu

Note that by default, menu options * and # are pre-defined. The * option will play the message"*To return to the previous menu, press star*", and the # option will play the message "*To return to the main menu, press pound.*" In this example, the TankLevelsMenu is always opened from option 2 on the MainMenu;

therefore, the **Option *** check box may be cleared by clicking on it. In addition, the menu prefix option will be configured to automatically return to the main menu. Therefore, the # option may also be cleared.

The purpose of the TankLevelsMenu is to enunciate the values of two SCADA system variables, ChlorineTankLevel and LowerTankLevel. (These two variables must be added to the main screen's **Analog** tab. ***See**:* Entering Tag Names.)

To play the tank level values, a multi-segmented menu prefix message must be created to announce the analog tag values representing the tank levels. The message should sound something like this: "*The chlorine tank level is twelve point two feet. The lower tank level is fifteen point nine feet.*" Click on the **Menu Prefix** label to open the **Menu Item** window. The window below shows how such a multi-segmented message is assembled:



TankLevelsMenu multi-segmented message

Since the message will always be announced whenever the TankLevelsMenu is accessed, **Menu Item Enabled** is set to **Always Enabled.**

To compose the message, click in the **Menu Item Message Composition** box. In the above example, the message contains six segments. Each segment is created as follows:

1. Click the **Add** button. In the **Message Segment** window, type the filename "TheChlorineTankLevelIs" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "The chlorine tank level is". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window
2. Click the **Add** button. In the **Message Segment** window, click the **Analog Value** option and click the **Browse** button to see a list of Analog tags. Select ChlorineTankLevel and click the **OK** button. Adjust the slider so that ChlorineTankLevel will display one decimal place. Click the **OK** button to return to the **Menu Item** window.
3. Click the **Add** button. In the **Message Segment** window, type the filename "Feet" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the word "Feet". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window
4. Click the **Add** button. In the **Message Segment** window, type the filename "TheLowerTankLevelIs" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "The lower tank level is". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window
5. Click the **Add** button. In the **Message Segment** window, click the **Analog Value** option and click the **Browse** button to see a list of Analog tags. Select LowerTankLevel and click the **OK** button. Adjust the slider so that LowerTankLevel will display one decimal place. Click the **OK** button to return to the **Menu Item** window.
6. Click the **Add** button. In the **Message Segment** window, click the browse button to see a list of WAV filenames. Select "Feet" and click the **OK** button. Click the **OK** button to return to the **Menu Item** window

Note: WAV file segments may be edited to eliminate beginning or ending pauses. ***See****:* Editing WAV Files

The TankLevelsMenu will be configured to return to the previous menu after announcing the tank levels without requiring the caller to press a key. To do this, set the **Menu Item Action** to **Play Menu.** Use the **Browse** button to see a list of menu names and select $PrevMenu. $PrevMenu is a system variable that contains the name of the previous active menu (MainMenu in this case). Click the **OK** button to return to the **Menu Item** window.

Once the TankLevelsMenu's prefix item is set up, click **OK** to return to the **Menu Information** window. Click **OK** again to return to ScadaPhone's main window.

Testing the TankLevelsMenu

To test the TankLevelsMenu, highlight MainMenu on the **Menus** tab and click the **Test** button. Unless the MainMenu has been modified, it should say "*Main menu, to enter your security code, press zero*." The menu will pause briefly and then repeat itself for up to one minute until zero is clicked. When zero is clicked on the **Menu Test** window, ScadaPhone presents the $EnterCodeMenu. This menu states: "*Enter code followed by pound sign.*" Enter a valid user code. (*Details:* Create a User's List.) When a valid code is entered, ScadaPhone will state the user's access level and then say: "*Main menu. To hear the alarm menu, press one. To hear tank levels, press two*." Press 2 to hear the TankLevelsMenu. When the TankLevelsMenu is finished reporting the tank levels, ScadaPhone will return control to the MainMenu. Click the **Stop** button on the **Menu Test** window to terminate the test.

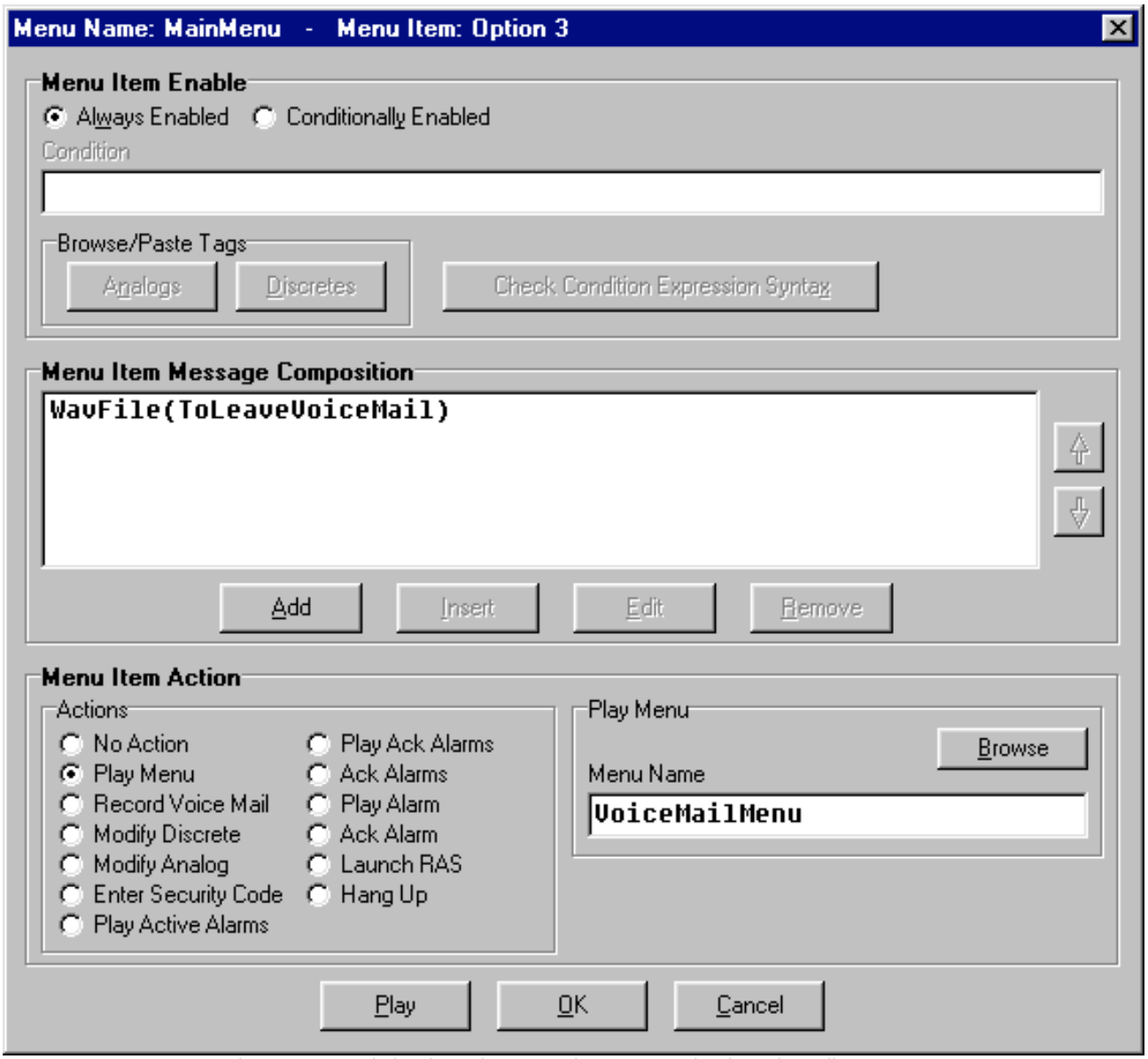
Related Topic: Adding and Editing Menus

Menu Item Action Example

Record Voice Mail

In this example, ScadaPhone's MainMenu option 3 will be set up to record voice mail. When the MainMenu is played, option 3 will say "To leave voice mail, press 3". This option will open a menu named VoiceMailMenu. The VoiceMailMenu will allow the caller to leave mail for either the Supervisor or the Secretary.

To edit the MainMenu, select the **Menu** tab on the main screen, select MainMenu and click the **Edit** button. This will open the **Menu Information** window. Click the check box by **Option 3**. The label will change from gray to black, indicating that Option 3 properties may now be edited. Click on the **Option 3** label to open the **Menu Item** window.



The Menu Item window for MainMenu option 3 - set to play the VoiceMailMenu

Option 3 is set to **Always Enabled** so that anyone, even people who are not authorized system users, will have access to the VoiceMailMenu.

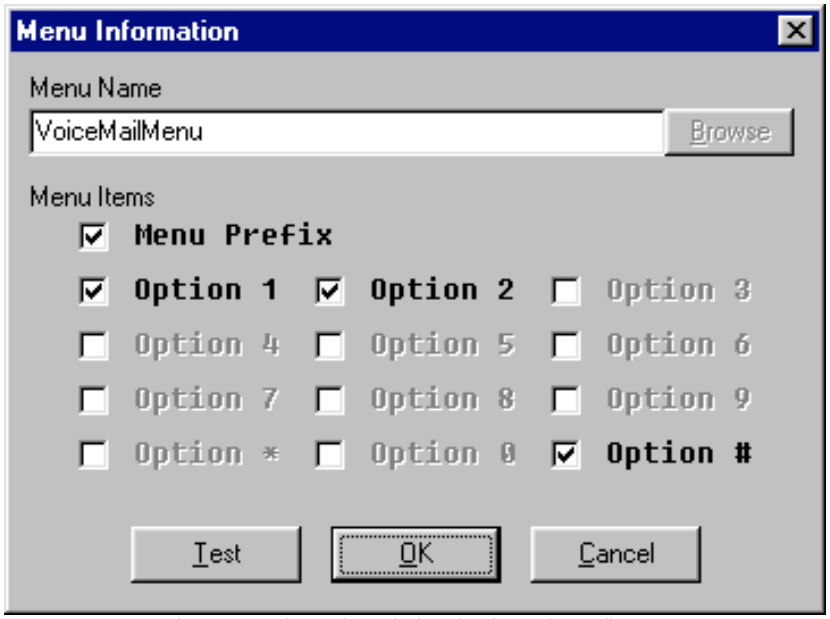
The message for MainMenu option 3 will consist of a single WAV file saying "*To leave voice mail*." Record a WAV file by clicking the **Add** button in the **Menu Item Message Composition** section. In the **Message Segment** window, type the filename "ToLeaveVoiceMail" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "To leave voice mail". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window.

The **Menu Item Action** is set to **Play Menu.** Enter the menu name as VoiceMailMenu.

Once the **Menu Item** window is complete, click the **OK** button. Click **OK** from the **Menu Information** window to save the MainMenu with its new option 3.

Creating the Voice Mail Menu

To create the VoiceMailMenu, click the **New** button from the **Menus** tab of the MainMenu. This will open the **Menu Information** window. Enter "VoiceMailMenu" in the Menu Name edit box. In this example two mailboxes are set up, Supervisor and Secretary. The menu will say the following : "*Voice mail menu. To leave a message for the supervisor, press 1. To leave a message for the secretary, press 2*."

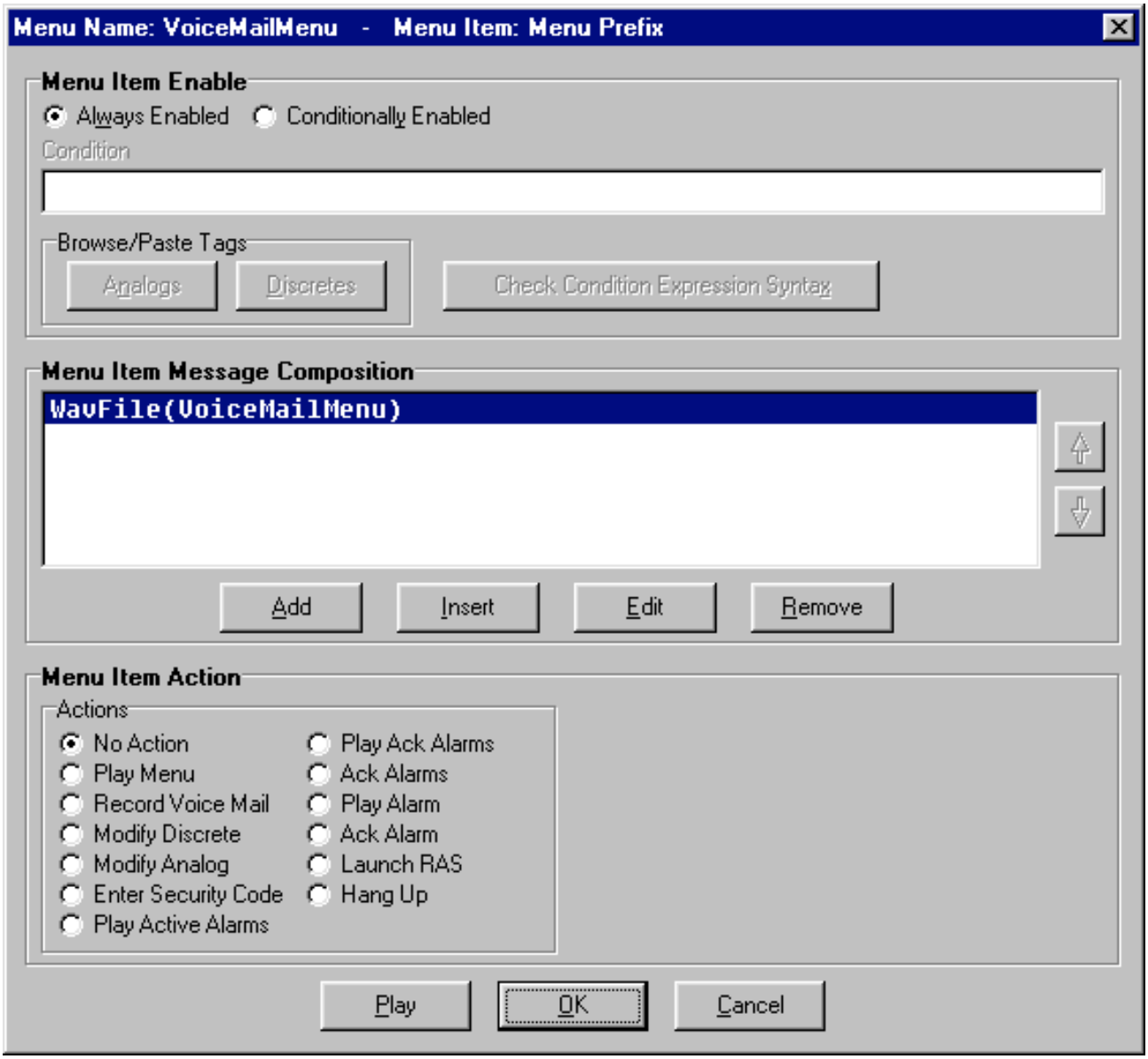


The Menu Information window for the VoiceMailMenu

Note that by default, menu options * and # are pre-defined. The * option will play the message"*To return to the previous menu, press star*", and the # option will play the message "*To return to the main menu, press pound.*" In this example, the VoiceMailMenu is always opened from option 2 on the MainMenu; therefore, the **Option *** check box may be cleared by clicking on it.

Voice Mail Menu Prefix Option

The words "Voice mail menu", will be handled by the menu prefix. In the **Menu Information** window, check the menu prefix box and click the Menu prefix label. This will open the **Menu Item** window:



The Menu Item window for the VoiceMailMenu prefix option

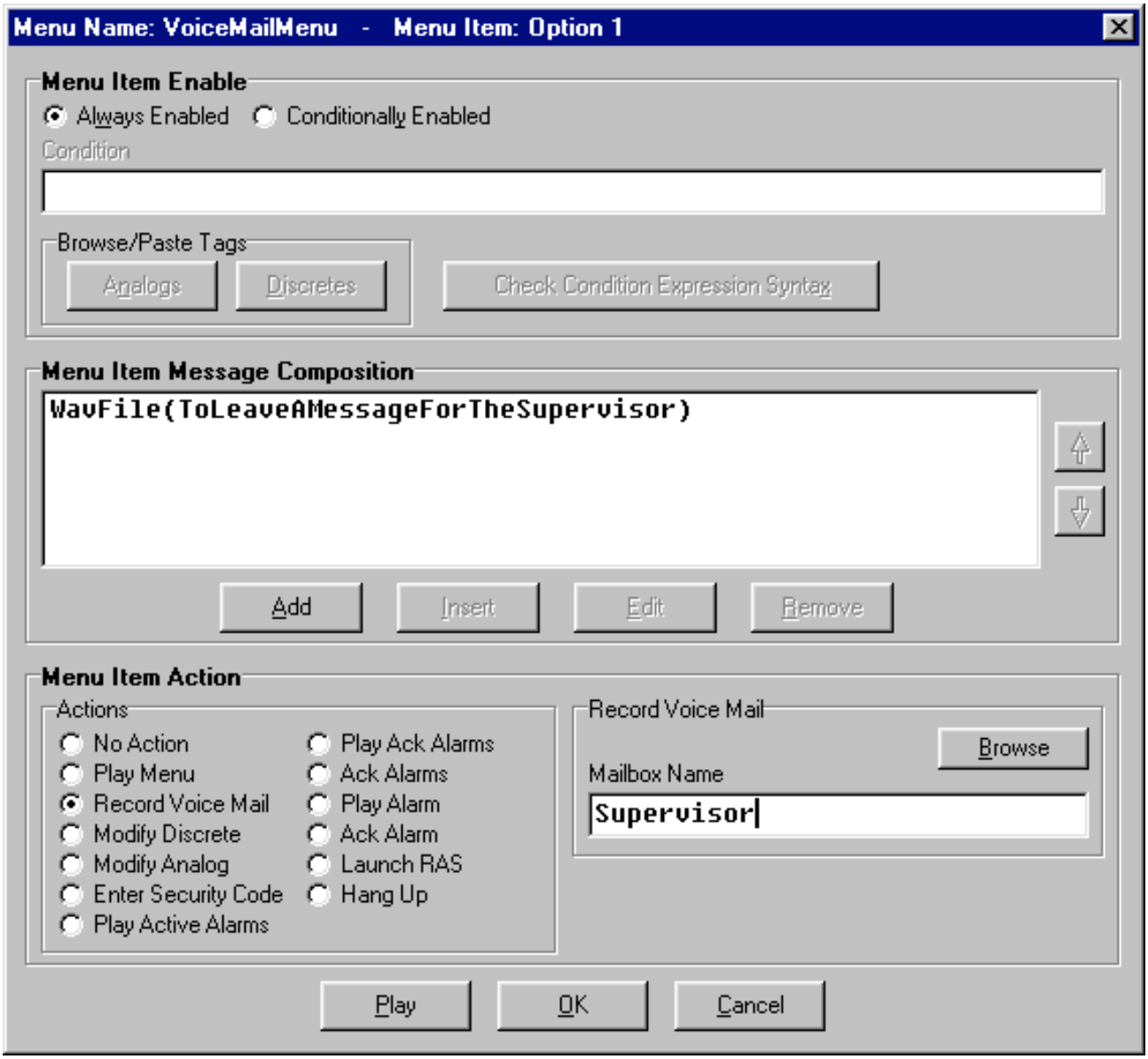
The menu prefix is set to **Always Enabled.**

The **Menu Item Message Composition** box consists of a single WAV file. Click the **Add** button. In the **Message Segment** window, type the filename "VoiceMailMenu" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "Voice mail menu". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window.

Set the **Menu Item Action** to **No Action.** Click **OK** to return to the **Menu Information** window.

Voice Mail Menu Options 1 and 2

The VoiceMailMenu Option 1 in the **Menu Information** window will be set up to record voice mail for the supervisor. Check the menu Option 1 box and click the Menu Option 1 label. This will open the **Menu Item** window:



The Menu Item window for the VoiceMailMenu Option 1

- The menu prefix is set to **Always Enabled.**

- The **Menu Item Message Composition** box consists of a single WAV file. Click the **Add** button. In the **Message Segment** window, type the filename "ToLeaveAMessageForTheSupervisor" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "To leave a message for the supervisor". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window.

- Set the **Menu Item Action** to **Record Voice Mail.** In the Mailbox name, type "Supervisor". Click **OK** to return to the **Menu Information** window.

The VoiceMailMenu option 2 will be set up to record voice mail for the secretary. It is set up in an identical manner to option 1, only substitute the word "secretary" for "supervisor". Check the menu Option 2 box

and click the Menu Option 2 label. This will open the **Menu Item** window.

- Ÿ The menu prefix is set to **Always Enabled.**

- Ÿ The **Menu Item Message Composition** box consists of a single WAV file. Click the **Add** button. In the **Message Segment** window, type the filename "ToLeaveAMessageForTheSecretary" and click the **Record** button. When the ScadaPhone message box indicates it is recording, speak the words "To leave a message for the secretary". Click the **Stop** button to stop recording. Click the **OK** button to return to the **Menu Item** window.

- Ÿ Set the **Menu Item Action** to **Record Voice Mail.** In the Mailbox name, type "Secretary". Click **OK** to return to the **Menu Information** window.

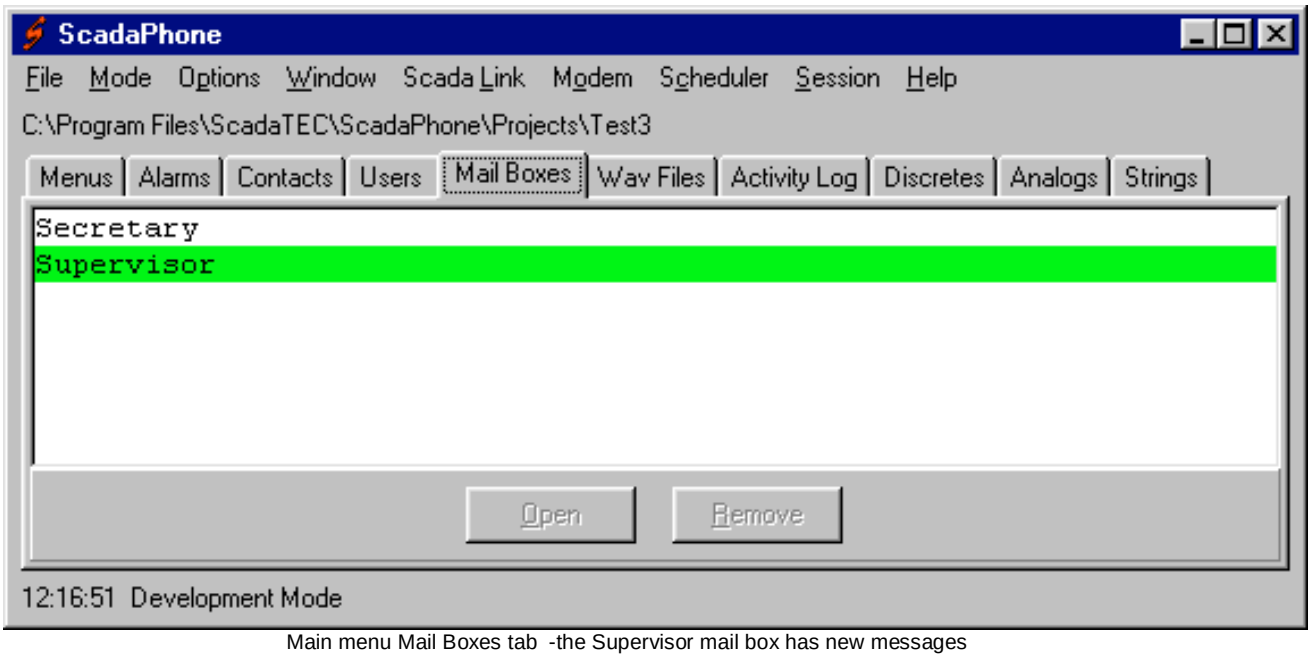
When a mailbox is created as above, the mailbox name will be added to the **Mail Boxes** tab on ScadaPhone's main window.

Related Topic: Adding and Editing Menus

Testing the Voice Mail Menu

To test the VoiceMailMenu, from the **Menus** tab of ScadaPhone's main window, highlight MainMenu and click the **Test** button. The MainMenu should say the following : "*Main menu. To leave voice mail, press two. To enter your security code, press zero*." Press 2 to test the VoiceMailMenu. The VoiceMailMenu should say:"*Voice mail menu. To leave a message for the supervisor, press one. To leave a message for the secretary, press two. To return to the main menu, press pound.*" Press 1 to leave a message for the supervisor. ScadaPhone will respond by playing the $VoiceMailPrompt system menu: "*Record message after the tone. Press any key when finished. <beep>.*" Say a few words into the microphone, (which is the active recording device when testing in development mode), and click one of the **Menu Test** window buttons (except for the Stop button) when the test message is complete. ScadaPhone will return to the VoiceMailMenu. Click the **Stop** button on the **Menu Test** window to terminate the test.

To hear the test message, select the **Mail Boxes** tab on ScadaPhone's main window. The Supervisor mailbox is displayed with a green background to indicate that there are new messages:



Main menu Mail Boxes tab -the Supervisor mail box has new messages

To listen to the test message, double click on Supervisor. This will open the **Mail Box** window:

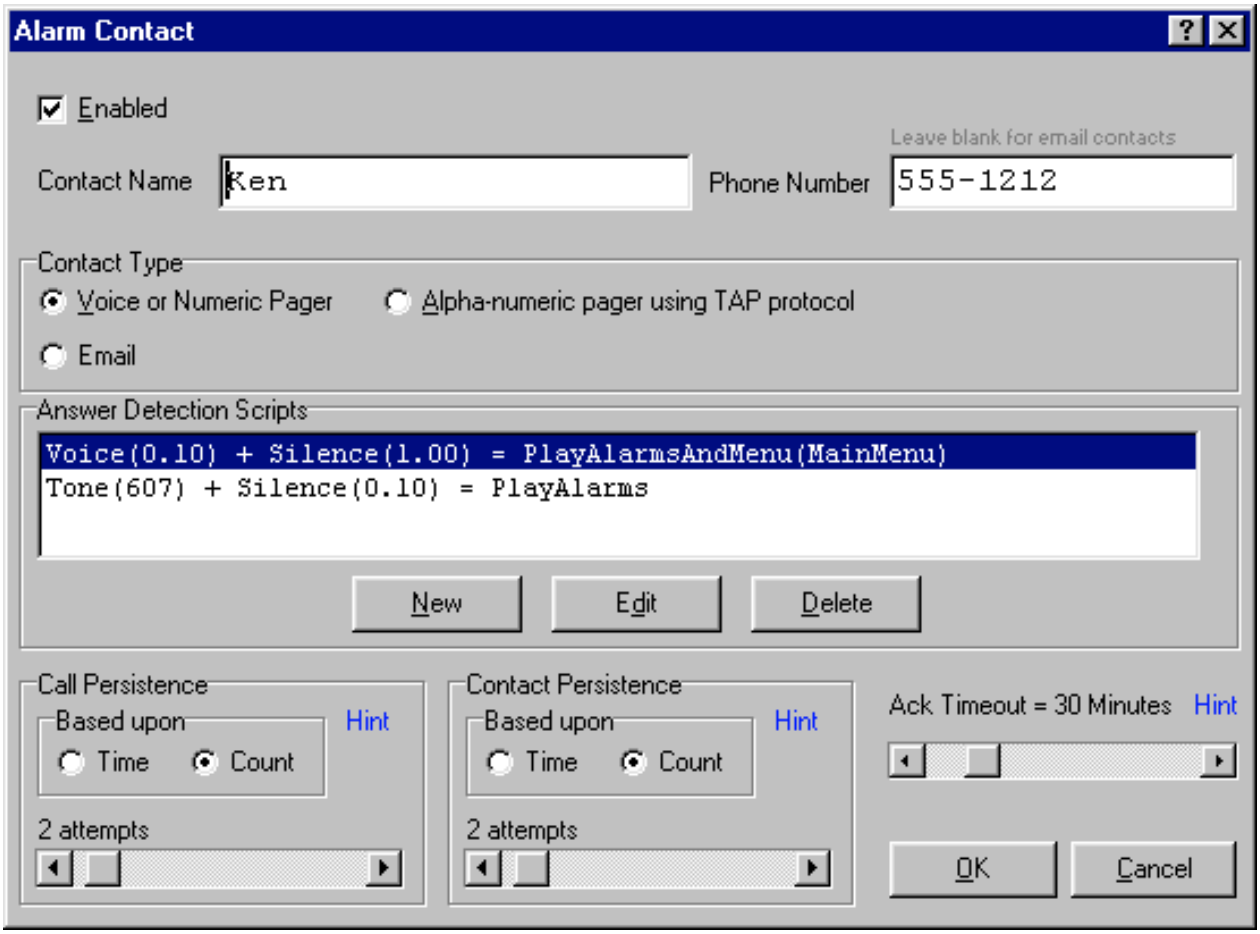
The Mail Box window for the Supervisor

Messages are placed into WAV files that are time-stamped to indicate the date and time that the message was recorded. To hear voice mail messages, highlight the desired message and click the **Play** button. Delete old messages by highlighting them and click the **Remove** button. Click the **Close** button to return to the ScadaPhone main window.

Alarm Contact Window Example

Answering Machine Contact Example

Answering machine contacts usually use two Answer Detection Scripts in the **Alarm Contact** window. This allows ScadaPhone to perform one action if a person answers the phone and perform a different action when a voice mail system or an answering machine answers. The following example has two such scripts:



Two scripts, one for a live person and one for an answering machine

Note that the first script is a modified version of the default script ScadaPhone creates when a new contact is created. This script is used to detect when a live person answers the phone. Whenever ScadaPhone hears a voice followed by one second of silence, ScadaPhone will announce the list of active alarms and then present the MainMenu. If ScadaPhone fails to detect the conditions in the first script, it will listen for the events in the second script, a tone with a frequency of 607 Hz. followed by .1 seconds of silence.

To create an Answer Detection Script that checks first for a live person and then for an answering machine message requires three steps:

1. *Record a new script to capture the tone at the end of the answering machine message*
   To record a new script, click the **New** button in the **Alarm Contact** window. This opens the **Edit Script** window. Click the **Record** button to open the **Record Script** window. Verify that the phone number in the top box is correct, click the **Call and Record** button, and then click the **Set Action Point** button to stop recording. ScadaPhone will return to the **Edit Script** window. The new script should be listed in the **Events** box and contain a Tone event followed by a Silence event. For answering machine messages, usually the action is left as the default **Play Alarm** option. Click the **OK** button to return to the **Alarm Contact** window. The new script should be listed after the default script. *Details*: Creating New Answer Detection Scripts

2. *Analyze the length of any pauses in the new script with the Audio Analyzer*
   The length of the silence event in the first script is important. This is to prevent the first script from being triggered during brief pauses in the recorded message. For example, an answering machine might play the following message: "Hi this is Ken. <Pause> I'm away from

my desk. <Pause> Leave your name and number and I'll call you back. <Beep>." The length of the Silence event in the first script must be longer than the pauses in the recorded answering machine message. To determine the length of the pauses in the answering machine message, click the **OK** button on the **Alarm Contact** window to close it and select **Window | Audio Analyzer** from the main menu to open the Audio Analyzer. The Audio Analyzer automatically loads the most recent sound (or WAV) file. If the most recent file is not the correct file, a different file may be selected by clicking the blue file name link at the top of the window. The Events within the WAV file are listed in the **Script Events** box on the right side of the window. The Silence events are followed by a numeric value which gives the length of the event in seconds. Determine which is the longest silence event and make a note of this value. Click **Close** to exit the Audio Analyzer. *Details*: The Audio Analyzer

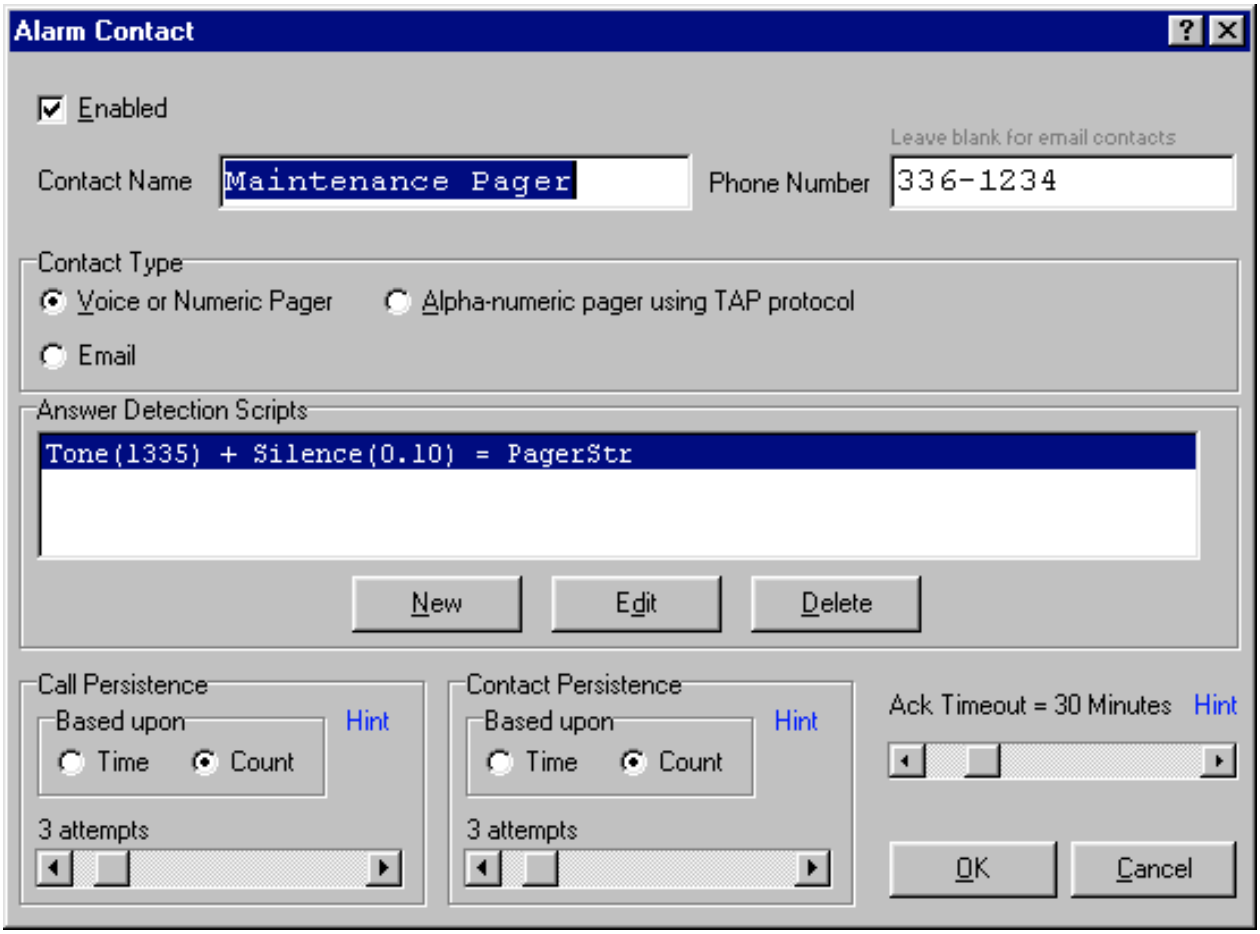
3. *Adjust the length of the silence event at the end of the first script to be longer than the longest pause in the new script.*
   Select the contact name on the **Contacts** tab and click the **Edit** button to reopen the **Alarm Contact** window. Select the first script and click the **Edit** button. This will open the **Edit Script** window. Select the Silence event and adjust the slider bar in the **Event Parameter** panel until the length of the silence event is longer than any pauses in the recorded answering machine message. Click the **OK** button to return to the **Alarm Contact** window.

To see how the above settings work, assume the following events take place: An alarm triggers and a call is placed to Ken, but his line is busy, so ScadaPhone hangs up. ScadaPhone counts this as a failed call, so the **Call Persistence** setting is checked. Less than thirty minutes have elapsed since the first dialing attempt was made, so another call is attempted. This time, Ken answers, "Hello, this is Ken. May I help you?" Ken must know to pause at least one second after his greeting, in case ScadaPhone is trying to reach him and for the Answer Detection Script to work properly. Ken pauses the required one second and ScadaPhone recognizes the required events for the first script: Voice for at least one tenth of a second and Silence for one second. Therefore, ScadaPhone plays the alarms and presents Ken with the Main Menu. However, Ken fails to acknowledge the alarms within the **Ack Timeout** interval (30 minutes). ScadaPhone checks the **Contact Persistence** setting. The **Contact Persistence** is set to two attempts and only one attempt has been made; therefore, another call is placed to Ken. This time, Ken's answering machine answers the phone. When ScadaPhone detects the Tone event (the beep at the end of the answering machine message), followed by a tenth of a second of Silence, the second script is triggered and ScadaPhone plays the Alarm menu. Once again, ScadaPhone hangs up and waits for acknowledgements. If Ken still fails to acknowledge the alarms with thirty minutes, ScadaPhone will start trying to call the next contact in the **Scheduler's** contact list.

Alarm Contact Window Example

Pager Alarm Contact Example

A pager alarm contact might have settings in the **Alarm Contact** window similar to the following:

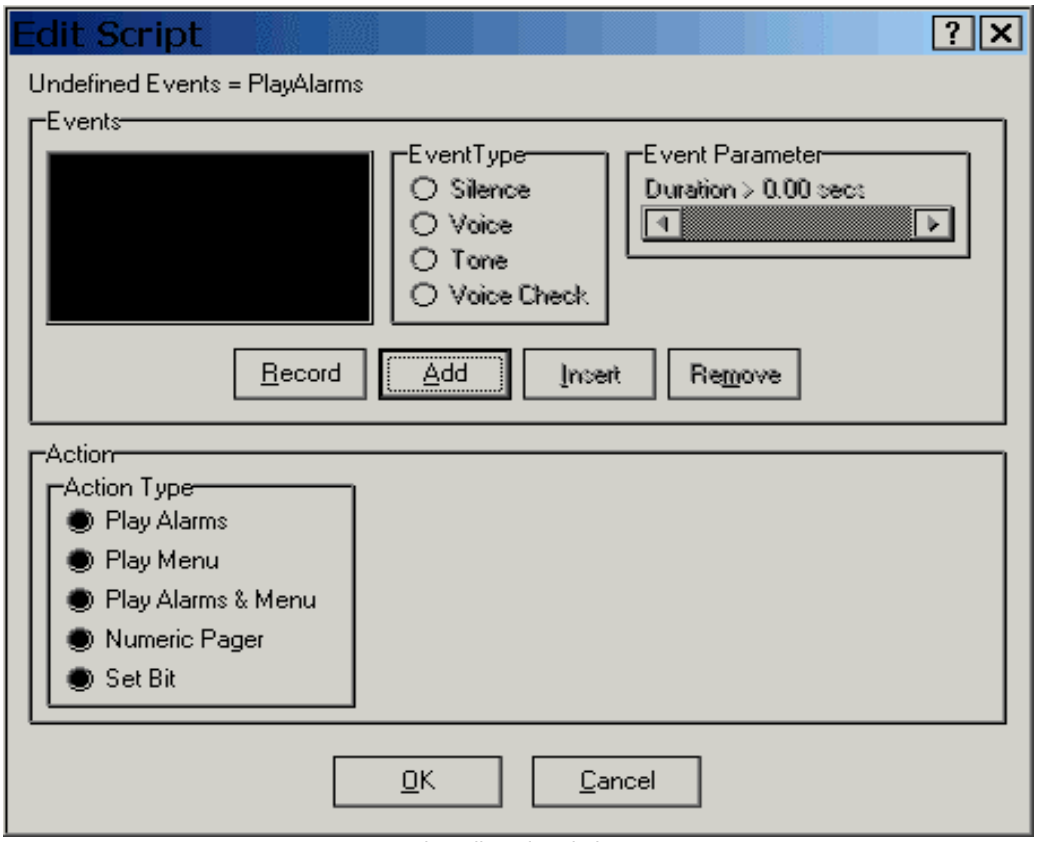


The Alarm Contact window with Maintenance Pager settings

The above Maintenance Pager contact is defined with the following settings:

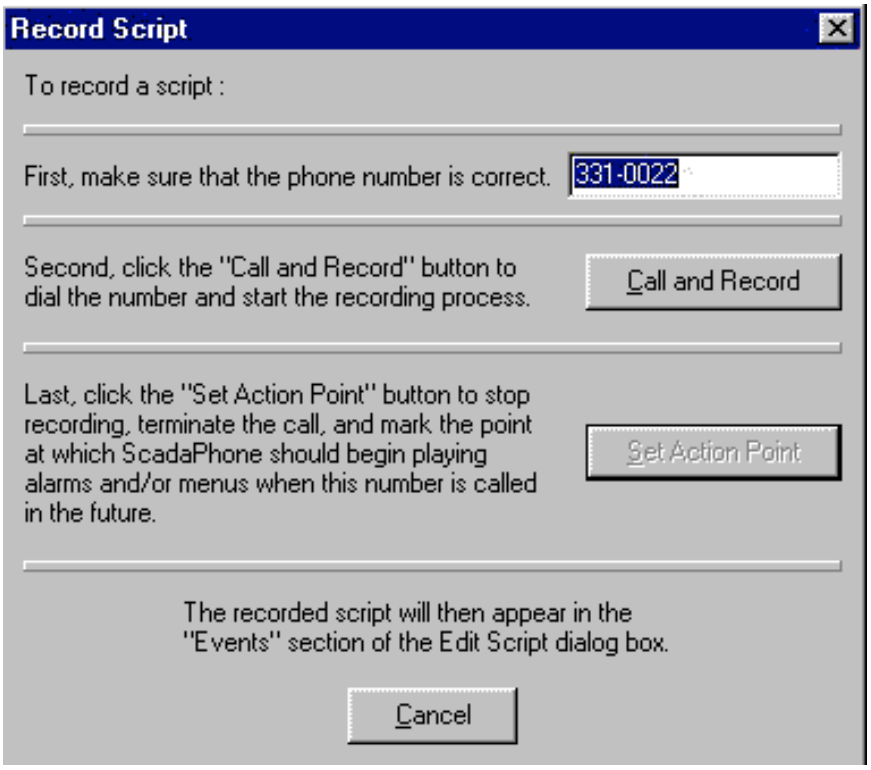
- **Answer Detection Script**: Tone(1335) + Silence(0.10) = PagerStr
- **Call Persistence**: Based upon time, 3 minutes.
- **Contact Persistence**: Based upon count, 3 attempts
- **Ack Timeout**: 30 minutes.

The Answer Detection Script is set to "`Tone(1335) + Silence(0.10) = PagerStr`". This script causes ScadaPhone to listen for a sound frequency of 1335 Hz. followed by at least a tenth of a second of silence. When ScadaPhone detects this, it will send the value stored in the system variable named PagerStr. (**Note**: The value stored in PagerStr is set from the main window under **Options | Pager String**.) The first part of this script, (`Tone(1335) + Silence(0.10)` in the above example), may be set up by recording the events. To record a script, click the **New** button; this opens the **Edit Script** window.



The Edit Script window

To record a script, click the **Record** button in the **Edit Script** window. This will open the **Record Script** window:

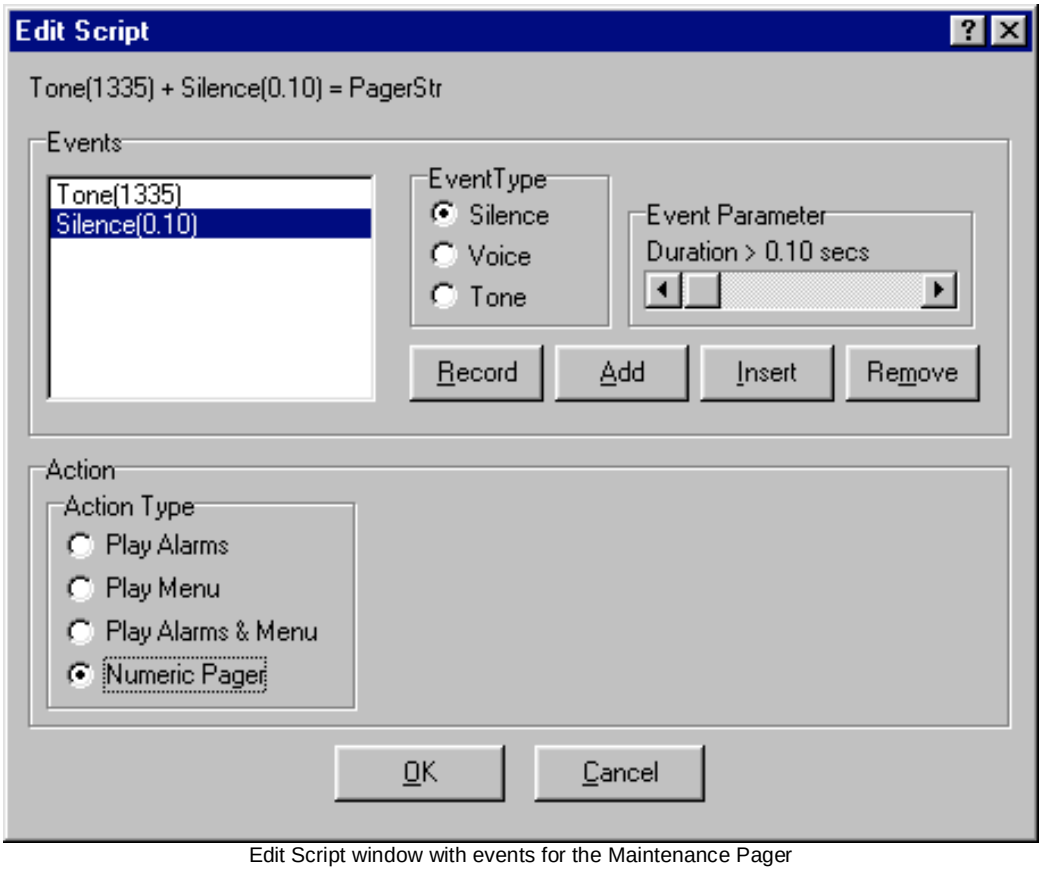


Recording a script requires three steps:

1. Verify that the phone number in the top box is correct or make any needed changes
2. Click the **Call and Record** button
3. Click the **Set Action Point** button to stop recording.

After step 3, ScadaPhone will return to the **Edit Script** window. The recorded script will be entered into the **Events** box.

After recording the script, select the **Numeric Pager** option in the **Edit Script** window. This adds the last part of the script, "`= PagerStr`". **Note**: The value stored in PagerStr is set from the main window under **Options | Pager String**. The **Edit Script** window should appear similar to the following:



Edit Script window with events for the Maintenance Pager

Click the **OK** button to exit the **Edit Script** window and return to the **Alarm Contact** window. The **Alarm Contact** window should now contain an answer detection script for a maintenance pager.

To see how the above Maintenance Pager settings work, assume the following events take place: An alarm triggers, a call is placed to the Maintenance Pager, but the pager service's line is busy, so ScadaPhone hangs up. ScadaPhone counts this as a failed call, so the Maintenance Pager's **Call Persistence** setting is checked. Less than three minutes have elapsed since the first dialing attempt was made, therefore another call is attempted. This time, the pager service answers and beeps; so, ScadaPhone transmits the pager string, hangs up the phone, and goes into Awaiting Acknowledgment mode. However, the person on-call fails to call back and acknowledge the alarm within the **Ack Timeout** interval (thirty minutes). ScadaPhone checks the **Contact Persistence** setting. The **Contact Persistence** is set to three attempts and only one attempt has been made; therefore, another call is placed to the Maintenance Pager. Once again, the call is successful, the beep is detected, the pager string is sent, the phone is hung up, and ScadaPhone waits for acknowledgements. This time, however, the person on-call calls in and acknowledges the alarm. This satisfies ScadaPhone's need for acknowledgement, so ScadaPhone goes into Idle mode awaiting the next alarm or incoming call. If either the **Call Persistence** or **Contact Persistence** settings are exceeded, ScadaPhone will abandon the current contact and start trying to call the next contact in the **Scheduler's** contact list.

Popups

Boolean

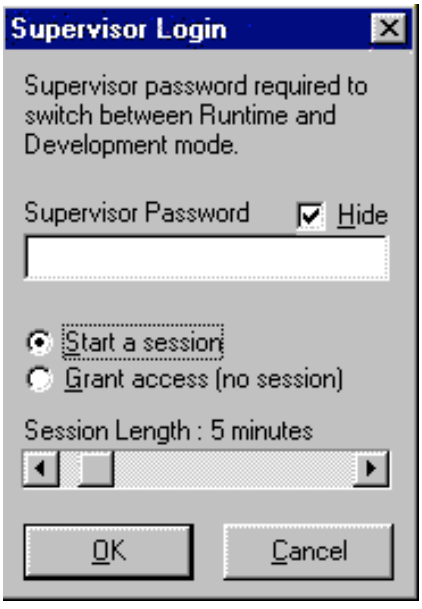
Boolean: A logical expression. In ScadaPhone, the Boolean expression will usually be an "If" statement checking the value of a system variable.

Development Mode and Run Mode

An indicator at the bottom of the ScadaPhone main window shows whether ScadaPhone is in Development Mode or Run Mode. The first time ScadaPhone is started, it will startup in Development Mode. After that, which ever mode ScadaPhone is in when exited is the mode it will start up in when next started.

To switch from one mode to the other, select **Mode** from the top menu and select either **Development** or **Runtime**. Access to ScadaPhone, including changing from one mode to another, is controlled by passwords. A user list must be created to specify passwords and access levels for authorized users of ScadaPhone. ***See***: Create a User's List

Changing from one mode to another requires a supervisor password. The following box will appear:



Enter the password and select either **Start a session** or **Grant access (no session)**. Starting a session allows access to ScadaPhone functions for up to sixty minutes without having to repeatedly enter the password. Use the scroll bar to set the session length. The Grant access option only gives access to perform a single operation. Click **OK** when finished.

Math Operators and Functions

Math Operators and Functions

AAA_Operators : (Analog op Analog = Analog)

- "+" ADD
- "-" SUBTRACT
- "*" MULTIPLY
- "/" DIVIDE
- "DIV" Integer division (returns quotient)
- "MOD" Integer division (returns remainder)

AA_Operators : op(Analog) = Analog

- TRUNC( ) Truncates floating point to integer (e.g. Trunc(123.99) = 123)
- FRAC( ) Returns fractional part of floating point (e.g. Frac(12.345) = 0.345)
- SQRT( ) Returns square root (e.g. Sqrt(4) = 2)
- ROUND( ) Rounds floating point to integer (e.g. Round(123.5) = 124)
- SIN( ) Returns sine of argument (given in radians) (e.g. Sin(1) = 0.84147...)
- COS( ) Returns cosine of argument (given in radians) (e.g. Cos(1) = 0.5403...)
- LN( ) Returns the natural log of argument (e.g. LN(10) = 2.302585)
- ABS( ) Returns the absolute value of argument (e.g. Abs(-123.45) = 123.45)

AAD_Operators : Analog op Analog = Discrete

- "<" LESS
- "=" EQUAL
- ">" GREATER
- "<=" LESS_EQUAL
- ">=" GREATER_EQUAL
- "<>" NOT_EQUAL
- "EQMASK" Bitmask comparison (i.e. Arg EQMASK Mask = True if Arg and Mask = Mask

  Example:

  Let's say you wanted to test to see if bits 0,1 & 7 are on in an analog tag (ATAG).
  Mask = 131 = 1000 0011
  Result = ATag EQMASK Mask

ATag Val	ATag (Bits)	Result
0	0000 0000	FALSE
7	0000 0111	TRUE
211	1101 0011	TRUE
210	1101 0010	FALSE
243	1111 0011	TRUE

Note that ATag and Mask can be tag names, analog constants, or complex expressions ie:
Result = 200 EQMASK 5
Result = (ATag+200) EQMASK (Setpoint1+Setpoint2)
Not that these forms would make any sense. Just think of EQMASK as being able to be placed anywhere in an expression that a relational operator (e.g. "<", ">", "<=",...) could be placed. It's a discrete operator that takes 2 analog arguments.

SSD_Operators : String op String = Discrete (string comparison)

- "=" STREQ_OPCODE
- "<" STRLT_OPCODE
- ">" STRGT_OPCODE
- "<=" STRLTE_OPCODE
- ">=" STRGTE_OPCODE
- "<>" STRNEQ_OPCODE

DDD_Operators : Discrete op Discrete = Discrete

- Ÿ "AND"
- Ÿ "OR"
- Ÿ "XOR" Analogous to "<>" for discretes
- Ÿ "XNOR Analogous to "=" for discretes

DD_Operators : op Discrete = Discrete

- Ÿ NOT Inverts argument

SSS_Operators : String op String = String

- Ÿ "+" STRADD_OPCODE (e.g. "String1" + "String2" = "String1String2")

ScadaPhone System Variables

Discretes:

$PrevMenuBit: Value is 0 when the Main Menu has not been invoked from another menu. Value is 1 when the Main Menu is accessed from another menu. The value of this variable may be checked in order to determine whether to play or not to play the system WAV file "ToReturnToThePreviousMenu".
$RASBit: Used internally. It is true whenever the remote access software is controlling the computer.
$ScadaLinkFailed: Value goes True(1) when the entire polling list fails to return a valid response. Is set to False(0) as soon as a valid polling response for any tag is received. This tag can be used to generate an alarm if the polling link to the SCADA software fails.

Analogs:

$AnalogInput: Contains the value of the analog number a user enters via the telephone when the Modify Discrete **Menu Action Item** is enabled.
$CurrentAccessLevel: Contains a value pertaining to the access level of the current caller. Before the caller enters a security code, this value is 0. After the caller enters a security code, the value will be set as follows:

Access Level	*Value*
Limited	1
Alarm Ack	2
Data Entry	3
Supervisor	4

See: Create a User's List

$NumActiveAlarms: number of alarms currently active
$NumConsoleAckAlarms: number of alarms requiring console acknowledgement
$NumPhoneAckAlarms: number of alarms requiring telephone acknowledgement
$**NumAckedAlarms:** number of acknowledged alarms
$Year: Current year
$Month: Current month
$Day: Current day
$Hour: Current hour
$Minute: Current minute
$Second: Current second
$DayOfWeek: Current day of the week

Strings:

$LastAlarmPlayed: name of the last alarm played for the caller
$NextActiveAlarm: name of the next active alarm which will be played for the caller

$NextConsoleAckAlarm: name of the next alarm requiring console acknowledgement which will be played for the caller
$NextPhoneAckAlarm: name of the next alarm requiring telephone acknowledgement which will be played for the caller
$**NextAckedAlarm(String):** Returns the tag name of the next acknowledged alarm. Used with the play acknowledged alarms feature.

Using the Windows Clipboard

To copy information into the Windows Clipboard:

1. Select the information to be copied by either dragging with the mouse or by using the **Shift**+(any arrow key)

   OR

   To select an entire document:

   Press **Ctrl**+A

   OR

   Open the **Edit** menu and choose **Select All**

   OR

   Right-click and choose **Select All**

2. To copy the information:

   Press **Ctrl**+C

   OR

   Open the **Edit** menu and select **Copy**

   OR

   Right-click and choose **Copy**

To paste information from the Windows Clipboard:

1. Select the window where the information needs to be pasted and position the insertion point.

2. Press **Ctrl**+V

   OR

   Open the **Edit** menu and select **Paste**

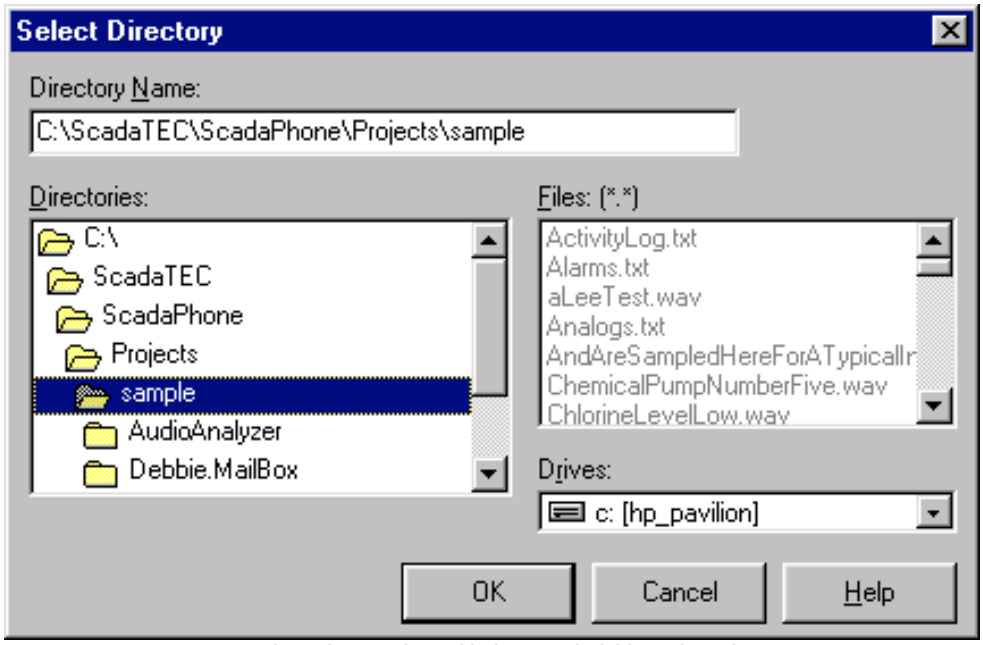
   OR

   Right-click and choose **Paste**

Using the Select Directory Window

The **Select Directory** window is opened when creating a new project, opening an existing project, and when saving the current project with a new name. To create a new project or open an existing project, select from the main screen's top menu **File | Project | Load/New**. To save a current project with a new name or to a new location, select **File | Project | Save As**.

The **Select Directory** window appears as follows:



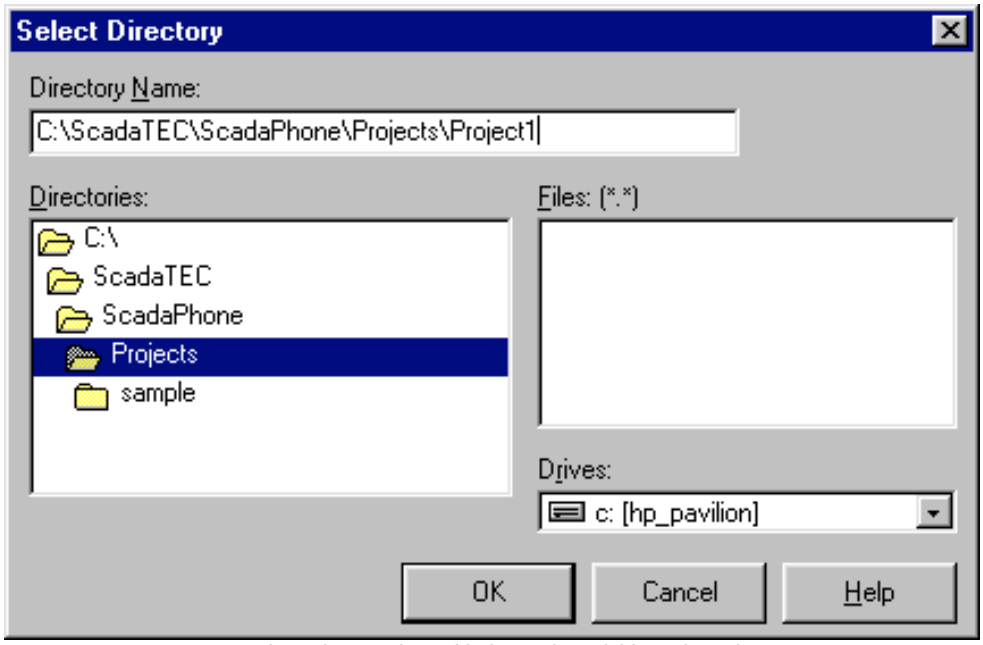
Select Directory box with the sample folder selected

The **Drives** box shows the current drive. To change drives, click the down arrow and select the correct drive.

The **Directories** box shows the folders on the current drive. (Only the folders contained within the lowest open folder in the list will be displayed at any one time.) To change folders, double-click on a folder name.

The **Files** box displays the files within the open folder. (A file cannot be opened with the **Select Directory** window.)

The **Directory Name** box shows the current path. To add a new folder, click at the end of the pathname in the **Directory Name** box. Type a backslash (\) followed by the project name at the end of the directory box. In the example below, a new project named **Project1** under the Projects folder is being created:



Select Directory box with the Projects folder selected
and a new Project1 added

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